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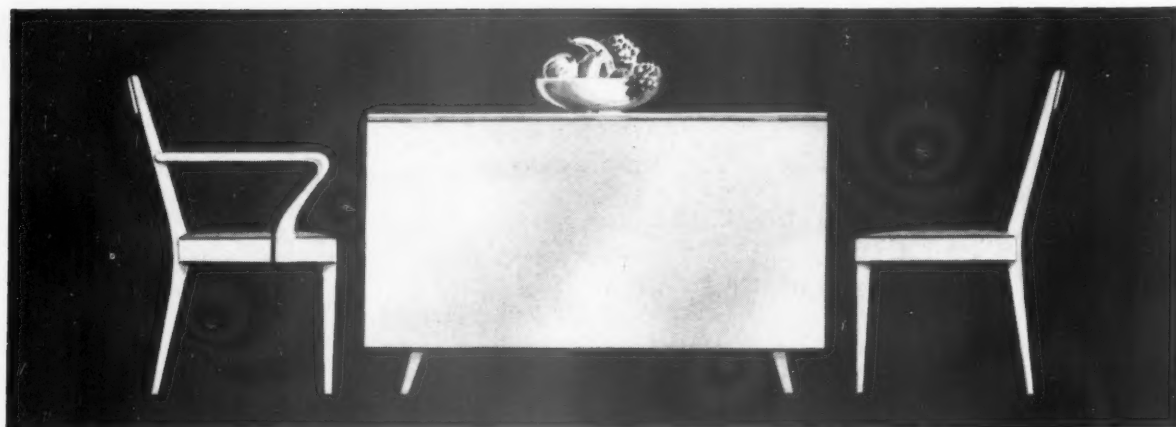
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# PAINT and varnish PRODUCTION

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VOL. XXX

No. 10

## NEXT ISSUE

As you all know the November issue will be devoted to the technical developments in the paint industry throughout the world. All articles to be presented in this issue are written by top paint technologists of the various nations. This will be the first International issue in the history of the paint industry and will afford an opportunity to learn and compare the paint manufacturing techniques and developments throughout the world. Be sure to see the November issue of PAINT and VARNISH PRODUCTION.

## ● FEATURES

Hot Lacquers, Part I, by Charles Bogin .....	8
Filters, by Rawdon Myers .....	12
Fineness of Grind, by George S. Cook .....	14

## ● DEPARTMENTS

Comment .....	7
Patents .....	22
New Products .....	25
News Digest .....	28
Technical Bulletins .....	30
Abstracts .....	32
Calendar of Events .....	34
Advertiser's Index .....	34

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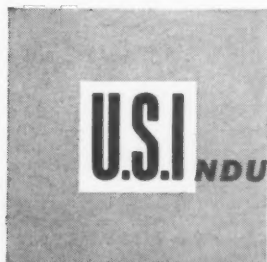
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Viscosity (G.H.) .....	Y-Z1
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Wt. Per Gallon @ 25°C. ....	7.9-8.0 lbs.



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# Editorial Comment

## Cooperation

WITH the present shortages of important raw materials limiting the production of trade sales items, representatives of the Paint Dealers Institute of New York have recently met with the Trade Sales Committee of the New York Paint, Varnish and Lacquer Association and discussed ways and means to insure fair and adequate distribution of paint supplies.

A chief concern confronting the metropolitan dealers is whether the manufacturers will assure them of a fair share of all merchandise produced on the basis of available raw materials. It was pointed out by the dealers that some manufacturers have in the past taken advantage of the raw material situation and serviced markets other than New York.

The New York Dealers are also wondering about the supply of painters' items such as white goods which every dealer needs to properly service his customer, namely the paint contractor. In this connection, the dealer informed the manufacturer that they should not be compelled to accept tie-in sales of colored or shelf goods in order to receive their share of white goods.

In answer to the above questions, the manufacturers have assured the New York dealers that they will receive a fair share of merchandise and every effort will be made to continue to produce painters' items on the basis of available raw materials so as to insure that the dealers' needs will be met. The manufacturers also deplored such action as tie-in sales of colored items in order to get whites and hoped that such practices would be eliminated.

On the other hand, paint manufacturers have

asked the cooperation of the dealers in that they not buy excessive amounts of merchandise and that they not build up large inventories. It was emphasized that the present material situation is chiefly due to excessive and scare buying and that dealers should use intelligence in buying for the immediate future. The manufacturers also stated that dealers must become used to the fact that all orders will take 2-3 weeks to deliver and can no longer expect deliveries in 2 or 3 days. Dealers were also warned to give to their own customers a fair share of merchandise from their own inventories, and urged to keep a careful watch on their accounts receivable so that they may pay for the merchandise they buy.

It was decided that similar meetings should be held from time to time in order to clear up any problems or misunderstandings that may arise as a result of the present or future shortages in raw materials.

We strongly endorse such cooperative meetings between the dealers and manufacturers and hope they will take place frequently. The dealer can be a very big help to the manufacturer in that they can report on trade sales trends so that the manufacturer may vary his production accordingly.

## Have You Made Reservations?

AS you all know, this year's convention of the National Paint, Varnish and Lacquer Ass'n. will be held in San Francisco on November 15-18, and the Federation of Paint and Varnish Production Clubs will hold their annual meeting and Paint Industries Show in Chicago on November 9-11.

Officers of the Association are mindful of the important part the West Coast plays in the NPV & L Ass'n., and therefore decided to hold their 1950 meeting there. On the other hand, the Federation feels that the interest of more of their members will be better served by holding their main convention in Chicago, but as part of the San Francisco program, they will have a Federation Day in the form of a West Coast Meeting.

Undoubtedly, many of you will not be able to attend both conventions, but there is no reason why you cannot attend at least one of the two meetings. These meetings will feature timely papers on recent advancements in paint technology, and the Paint Industries Show will exhibit new materials and equipment for your inspection. Make your reservations now!

MODERN nitrocellulose lacquers, based on half-second nitrocellulose, first appeared on the market around 1923, and their advantages of rapid drying and hardening, high durability, hardness and light color rapidly brought them to first place in industrial finishes. Like everything else on this earth, however, they are not free from faults and disadvantages, and these have handicapped their use in many places and have even caused their replacement by newer synthetics in part in automobile finishing. Three of the most important faults are:

1. Bad chalking of the earlier pigmented lacquers on exterior surfaces.
2. Comparatively low solids content.
3. Insufficient film-smoothness when applied by spraying.

The first of these disadvantages has by now been completely corrected by the development of resins and pigments of low chalking tendencies, and the modern automobile lacquers are as good as the synthetic finishes in this respect. Some effective measures for overcoming the other two faults were also developed around 1939, but their adoption by the lacquer industry has been greatly hampered by several conditions which developed during the war and post-war years. These conditions have completely disappeared in the last year, however, and the lacquer industry is now exhibiting very great interest in these methods for improving the quality of its products. These ideas will therefore be discussed briefly below:

### Hot Lacquers

THE disadvantage of low solids content in nitrocellulose lacquers can be almost completely overcome by applying them at elevated temperatures. This process was first developed around 1938 in the laboratories of *Commercial Solvents Corporation*,<sup>1</sup> and utilizes the basic fact that the viscosities of nitrocellulose lacquers decrease very substantially when their temperature goes up. Elevated temperatures can therefore be used to replace part of the thinner normally used to reduce lacquer viscosity, and the solids content of lacquers applied at 160°F. is as much as 60-70% above those of similar lacquers ap-

By CHARLES BOGIN,  
Commercial Solvents Corp.



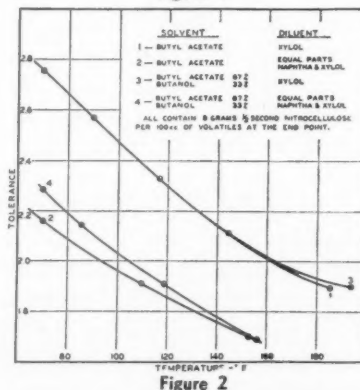
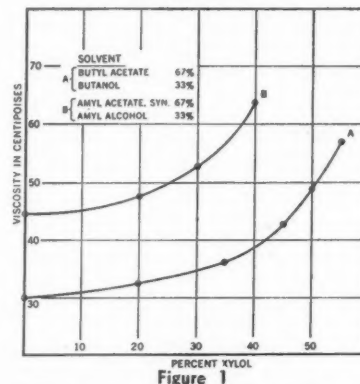
# Hot Lacquers

Part I of this series deals with such factors as solvent formulation of hot lacquers, equipment for spraying hot lacquers, and the advantages of the hot lacquer process. Mr. Bogin will discuss in detail film smoothness and drying properties of these lacquers in Part II, scheduled for the December issue.

plied at ordinary temperatures. While this increase in solids is not in itself sufficient to allow the replacement of two coats of cold lacquer by one of the hot variety, considerable help toward this end is obtained in actual lacquer application from the fact that hot lacquers are much less subject to sagging than those applied at ordinary temperatures and can therefore be applied in thicker liquid coats. By utilizing this aid, it is easy to obtain the same film thickness from one coat of hot lacquer as is now obtained from two coats of a corresponding cold material, thus putting on an equal level with varnishes and synthetic finishes as regards the number of spray coats necessary in a finishing operation.

This development first became available to the lacquer industry around 1939 and caused considerable interest at the time. Half a dozen lacquer firms promoted it actively, and a number of automobiles were

## PART I



coated with hot lacquer in one Detroit plant. The lacquer industry as a whole, however, did not follow up this idea before the recent war due mainly to several temporary commer-

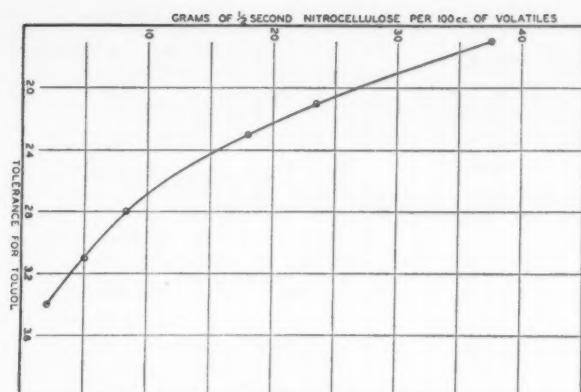


Figure 3

cial conditions. The process was utilized quite extensively during the war years in the application of airplane lacquers and dopes, but was not promoted by the lacquer industry to any extent at that time, or for the first few post-war years, partly because of the lack of satisfactory equipment for heating the lacquer, and partly because of the acute shortages in the field of slow evaporating solvents such as butyl acetate and butyl alcohol, which are essential in hot lacquers. The general raw material shortages in the lacquer industry during that period also discouraged active promotion of new ideas and products, and served to hamper the commercial development of this process considerably.

These obstacles have largely disappeared by now, however, and the "hot process" is at the present time being considered very actively by both the lacquer producers and their customers.

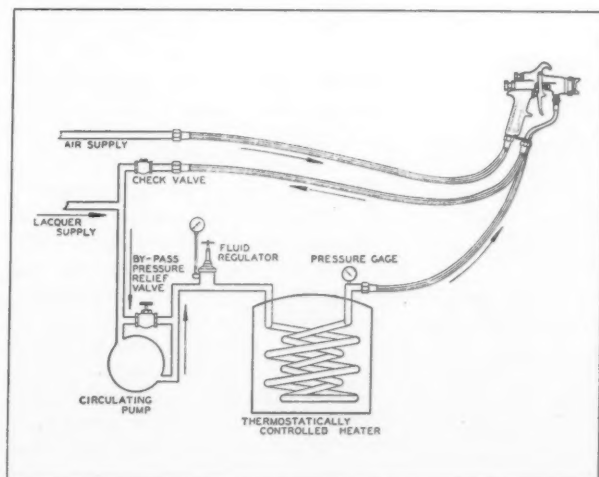


Figure 5. Typical system for applying lacquers at elevated temperatures.

### Solvent Formulation

THE experience of the lacquer manufacturers who have promoted hot lacquers before and during the war has been very satisfactory, and there are no difficult technical

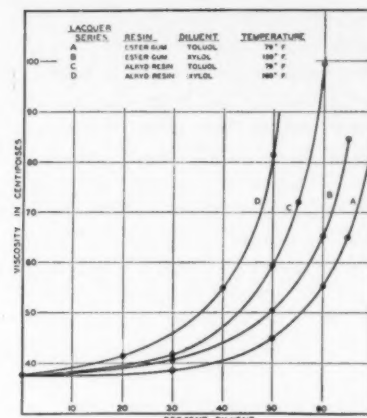


Figure 4

problems connected with either the formulation or the application of these materials. As is to be expected, the volatiles of hot lacquers must be formulated to contain appreciably larger proportions of slow-evaporating solvents than those used in cold

Table 1

Composition of the Lacquers	Lacquer for Application at:	
	Room Temperature	155°F
Non-Volatiles, lb/gal		
1/4 sec. nitrocellulose (dry basis).....	0.56	0.85
Alkyd Resin A.....	0.56	0.85
Dibutyl Phthalate.....	0.22	0.34
Pigment.....	0.51	0.76
Solids Content, lb/gal.....	1.85	2.80
Volatiles, % by volume		
n-Butyl Acetate.....	25	40
Butanol.....	10	15
Ethyl Acetate.....	10	—
Ethyl Alcohol*.....	5	10
Toluol.....	25	—
Naphtha (95°-130°C).....	25	—
Xylol.....	—	17.5
Naphtha (125°-145°C).....	—	17.5
Viscosity of the Lacquers		
At Room Temperature:		
Centipoises.....	37	170
Seconds, Ford Cup No. 4.....	19	47
At 155°F:		
Centipoises.....	—	37
Seconds, Ford Cup No. 4.....	—	19
Application Schedule		
Number of coats applied.....	4	2
Liquid pressure at gun, lbs.....	6	9
Atomizing pressure at gun, lbs.....	60	65
Rate of liquid flow, gal/hour.....	7.1	9.4
Film thickness, mils (average 12 readings).....	2.92	2.96
Sanding strokes required to remove all traces of orange peel (average of 5 tests on each of three panels).....	30	25

\*Including ethyl alcohol ordinarily added with the nitrocellulose



lacquers to compensate for the increase in the speed of evaporation of these volatiles at the higher temperatures, and for the large rise in viscosity during the spray operation caused by the rapid drop in temperature. The low-boiling solvents—ethyl acetate, methyl ethyl ketone, etc.—must be completely eliminated from any hot lacquers which are to be applied on reasonably large surfaces, and some of the toluol should be replaced by xylol. The lacquer should thus be formulated around butyl acetate, butanol, xylol, and toluol as the principal volatile materials. The use of solvents evaporating slower than the butyls is entirely unnecessary in the case of all ordinary hot lacquers, since the flow normally obtained in commercial cold lacquers can be fully duplicated, and even improved upon, by the simple replacement of the low boilers with butyl solvents without changing over from the butyl solvents themselves to more slowly evaporating materials. Also, the use of such extra-slow-evaporating solvents would nullify to a considerable extent the contribution of the hot process to increased solids content, since they produce lacquers of much higher viscosities than the butyl solvents.

Some typical data along this line will be found in Figure 1, which shows the differences in viscosity between lacquer based on butyl solvents and those employing two typical higher boiling materials—synthetic amyl acetate and amyl alcohol. Similar results are produced by the replacement of butyl acetate by other extra-slow-evaporating solvents, such as cellosolve acetate, butyl cellosolve, etc., since all of these produce nitrocellulose solutions of much higher viscosities than butyl acetate, and even higher than the synthetic amyl acetate used in Figure 1.

It is of interest to note that as a result of these viscosity differences, hot lacquers formulated with the amyl solvents have to be heated to much higher temperatures than the corresponding butyl lacquers to achieve the same viscosity. This temperature difference was found to be as high as 37° (F) in some tests, and the amyl mixtures were actually inferior in flow and film smoothness to the faster evaporating butyl mixtures at their higher temperatures.

#### Slow Solvents and Diluents

USE of these extra-slow-evaporating solvents is still more objectionable on the basis of their effect on the speed of hardening of the lacquer finishes. It was demonstrated time and again that the presence of these materials in proportions greater than 3–5% delays the hardening of lacquer films very materially, and their use in large proportion is therefore completely out of the question in lacquer finishes which are not to be force-dried. At the same time, repeated and extensive spray-flow experiments have demonstrated strongly that the presence of these slowly evaporating solvents in small proportions—less than 10%—does not contribute anything to the film-smoothness of sprayed lacquers.<sup>2</sup> The use of these extra-slowly-evaporating solvents in hot lacquers in sufficiently high proportions to affect their flow is thus virtually out of the question because of resulting bad effect on the hardening of the finishes.

Hot lacquers must also be formulated with slightly lower proportions of diluents than those used in cold lacquers, for two reasons: (1) The reduction in the solvent power and dilution ratios of solvents is caused by the higher temperature. (2) Similar reductions are produced by higher concentration of nitrocellulose in the hot lacquer. Some data on these two facts are shown in Figures No. 2 and 3. Figure No. 4 shows similar results from the standpoint of viscosity, and it will be seen that the large rise in viscosity produced by the presence of excessive proportions of diluents (the turn of the viscosity curve from the horizontal to the vertical direction), manifests itself in a hot lacquer at about 10% less diluents than in a corresponding cold material. The volatiles in hot lacquers should therefore be formulated with about 10% less diluents and 10% more solvents than those in corresponding cold lacquers, if minimum viscosity and maximum solids content are to be obtained.

A comparison of the performance behavior of a pair of parallel high quality cold and hot lacquers, formulated according to the principles above, is given in Table No. 1. This table is taken from a publication of the Commercial Solvents Corporation entitled "Application of Lacquers at Elevated Temperatures."

That publication also contains many technical details on the hot lacquer process which cannot be given in the present article because of space limitations.

#### Equipment

THE fundamental principles involved in most equipment proposed for raising the temperatures of the lacquers are comparatively very simple and are illustrated in Figure 5.<sup>3</sup> The temperature of the lacquer is raised in a heating device which is connected to the spray gun by a double hose and a circulating pump. This arrangement serves to maintain the lacquer in the hose at the proper temperature, and keeps it from cooling off if the spraying is temporarily interrupted or if the spray gun does not utilize all the lacquer supplied to it. There is also a Swedish device for heating the lacquer in the hose itself. It must be mentioned, however, that up to now the design and construction of fully satisfactory heating equipment has been one of the main difficulties which hampered the commercial development of the hot process, since such equipment must be made sturdy enough to withstand safely the abuse which it may meet in some lacquer-using plants without creating a fire hazard. The lacquer manufacturers who have successfully promoted hot lacquers in the last ten years have supplied their own equipment to the lacquer users and usually made arrangements to supervise their maintenance. Until recently, also, none of the equipment available on the market had the approval of the fire insurance underwriters, but this condition is being corrected at the present time, and it is now possible to obtain fully satisfactory, moderate-cost equipment for heating the lacquer.

#### Advantages

PRINCIPAL technical contribution of the hot process is that of reducing the number of spray coats by one half, thereby reducing the cost for spraying labor and for spraying equipment. The last saving can be very large indeed, as the reduction in equipment is not limited to the spray booths and spray guns directly involved in the spraying operations, but includes the drying space and conveyor equipment between the

(Turn to page 19)



# 3 IMPORTANT WAYS

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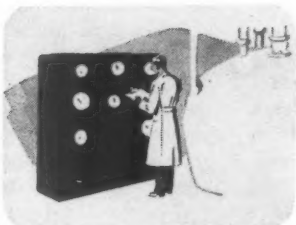
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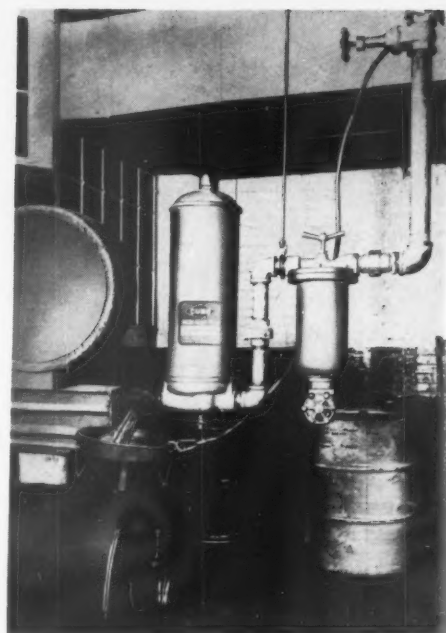
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By RAWDON MYERS  
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## improves quality of paint

**B**ROADLY speaking, a filter is a device for removing solids from fluids. The terms, filters and strainers, by the way, are often used synonymously. Strictly speaking, a filter denotes a unit for removing finer particles than a strainer. For convenience anything which removes solids .0025" or larger is considered a strainer. Those removing smaller particles, usually in the micron range, are considered filters.

As indicated, filters are designed to remove solids from liquids. In some industries the purpose is to recover the solids and discard the fluid. Specially constructed units are available for this purpose. This discussion, however, will be limited to those

units designed to clarify the liquid which is the usable product where the solids are discarded. This is the type of problem common to the paint industry.

### Types

**T**HERE are many specialized types of equipment marketed today to accomplish fluid clarification. For example, there are centrifuges by which solids are removed by accelerated gravitation created through the whirling of the fluid through a circle at high speeds. The solid particles being heavier than the liquid are thrown out of the fluid. There are flotation devices which depend either entirely or in part upon difference in specific gravity to accomplish the purpose, and there are magnetic separators which use magnetic

forces to secure the desired results.

This discussion will be limited to two relatively simple mechanical types of strainers and filters. They can be broadly classified as space types and depth types. Though these designations are convenient they are not always clear cut.

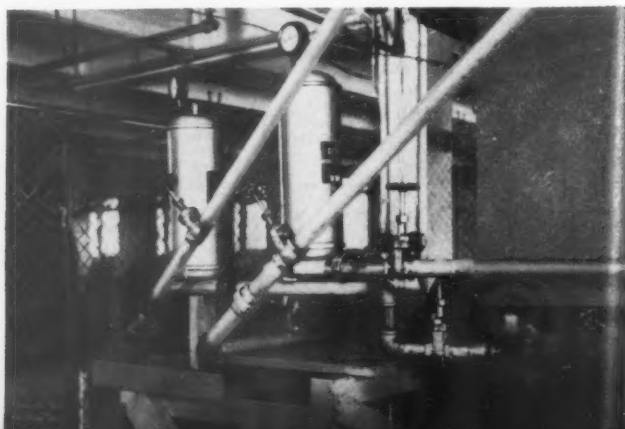
Space type filters are designed to offer a relatively clear and straight path for the passage of fluid, and to stop solids that are too large to enter the opening offered. The most common example of space type filter is the wire mesh screen or cheesecloth.

There are many installations today that use nothing more than this simplest of straining devices. Often they are not enclosed and depend entirely upon gravity to force the fluid through the straining medium.

Portable pumps and filtering unit remove unwanted solids from varnish drier as it is transferred from heat kettles into the shipping drums.



Recirculating stain is kept continuously clean with these filters which assure a very fine finish on wooden frames being dip-coated.



This type of installation has some very obvious advantages and disadvantages.

The initial and replacement cost per unit is low. The life of the unit, however, is short. There is the continual problem of maintaining a free clean area in order to maintain flow rate. The wire or cloth is easily damaged in cleaning.

If this damage is not noticed and the unit is replaced in service, it naturally does a very ineffective job. Last, but far from least, if the system is open, the product is continuously subject to contamination from dirt in the air.

The flow rates or capacities of todays can filling machines and the demands for continuous operations in spray painting and dip tank work require a filter or strainer somewhat less simple than the wire screen or cheesecloth. Such units are available. They are cleanable while in operation so there is no need to interrupt the process. They can be placed in pressure systems so that production may be accelerated. Being entirely closed they eliminate the possibility of air-borne contamination.

These filters usually consist of a metal cartridge either wire wound or slotted or both. They are cleaned either by scraping the surface with doctor or scraper blades or by brushing the surface with brushes.

#### Space Filter

**F**IGURE 1 is an example of a wire wound filter. It consists basically of a slotted cage with a screw thread cut in the surface. Wire is wound around the cage on this thread. The difference between pitch of the thread and the diameter of the wire determines the space between consecutive windings which in turn determines the size particle which will be removed. This cartridge is kept continuously clean by taking some of the filtered fluid and forcing it under elevated pressure by means of a continuously rotating backwash nozzle through the wire wound cage in the opposite direction from the process flow. These units are designed to handle large volumes of fluids. They are used for such services as pre-straining refrigerator enamels in the circulating lines.

Another example of a space type filter is shown in figure 2. This consists of a stack of flat wheel shaped

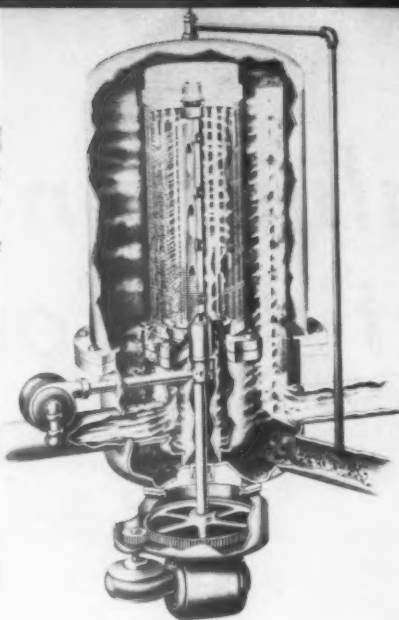


Fig. 1—Example of wire wound space type filter for straining enamels in production line.

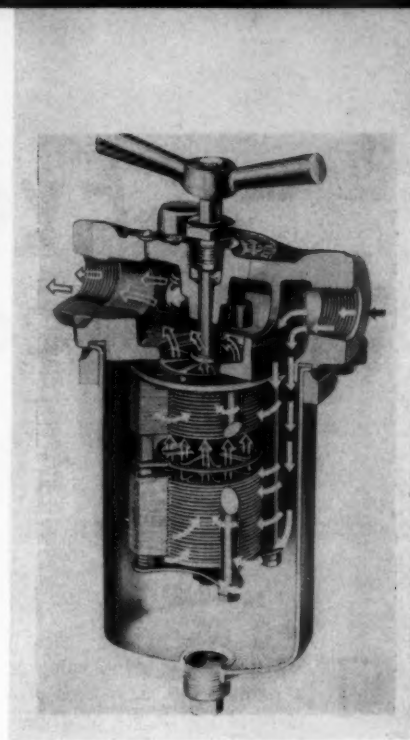


Fig. 2—Disc type; fluid passes between discs leaving oversize particles on outer surface.

Fig. 3—Depth type filter cartridge; removes oversolids micron in size.

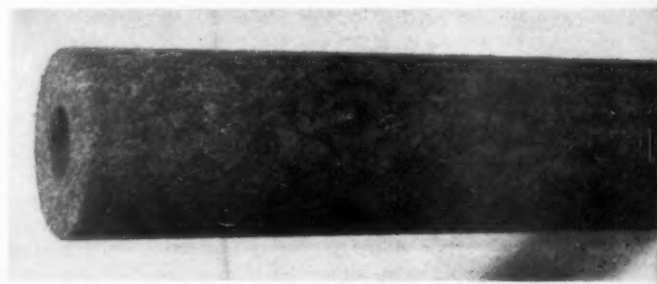
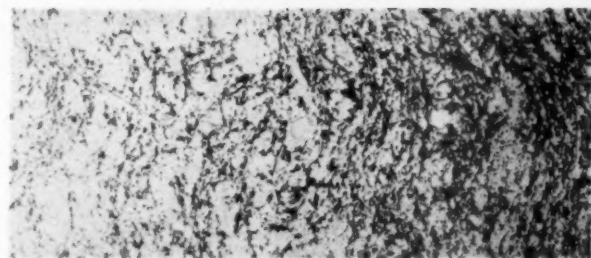


Fig. 4—Photomicrograph of cross section of depth type filter. Note progressively denser medium toward the discharge side of the filter.



discs, each one accurately separated from the next by a spacer conforming in shape to the hub and spokes of the disc, but without the rim. The thickness of this spacer determines the degree of filtration secured. Fixed along side the stack of discs is a rod holding knife-like stationary cleaner blades which extend into the slots between discs to the inside of the disc rim. The liquid to be filtered is intro-

duced into the space surrounding the filter element in the sump or housing and is forced by differential pressure between the inlet and outlet to flow through the slots between the discs to the passages within the filter element and thence to the outlet. All solids larger than the thickness of the spacer pieces are retained on the outer edge of the discs. When the  
(Turn to page 20)

# Evaluation of Protective Coatings

## FINENESS OF GRIND

### PART III



By **GEORGE S. COOK**,  
Engineer Research and  
Development Laboratories,  
Fort Belvoir, Va.

**T**HE fineness of grind value of a paint serves as a measurement of the degree of dispersion of the pigment in the vehicle and as a control on the texture of the paint film. Agglomerate, coarse, and insufficiently wet pigment particles are reduced to a minimum in a finely ground paint. Such particles reduce the hiding power and durability of the paint; promote a coarse or rough surface, and adversely affect gloss.

#### Factors Affecting Fineness

**T**HE size and shape of the pigment particles may limit the fineness of grind that may be obtained. Usually, however, the milling properties of the pigments are considerably more important than is the particle size. Many pigments form agglomerate particles while in dry

storage which may not be completely broken up and wetted by the vehicle in the mixing and grinding operations. Incorrect premixing of the pigment paste can cause lumping of the pigment which makes complete dispersion in the following grinding operation difficult. In addition, completely dispersed pigments may re-agglomerate upon standing and thereby give a paint of reduced fineness and of rough texture.

Mixing of the paste, if carried out to a smooth uniform condition, will materially increase the fineness of grind obtained in the subsequent milling operation. The use of a stiff paste during mixing will aid in the wetting of the pigment because of the greater shearing action obtained.

Thin pastes are preferably ground in a pebble mill with the fineness of grind being controlled by the duration of milling and the ratio of the volume of pebbles to the volume of

paste—the higher the ratio the finer the grind in the same time period. The roller mill is preferred for thick pastes but sometimes requires more than one pass to obtain paints of the desired fineness.

#### Method of Measurement

**Fineness of Grind.** (Method 441.1 Federal Specification TT-P-141b).

The device used for measuring fineness of grind shall be as shown in

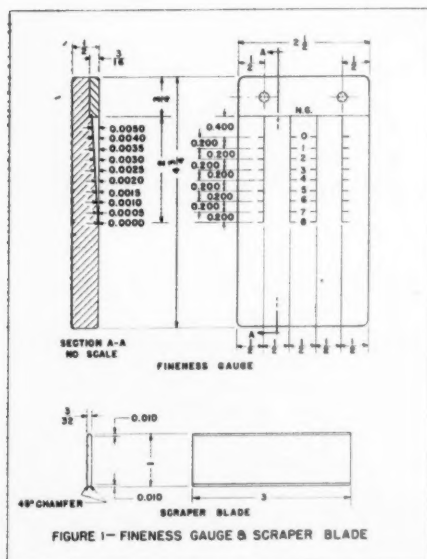


FIGURE 1—FINENESS GAUGE & SCRAPER BLADE

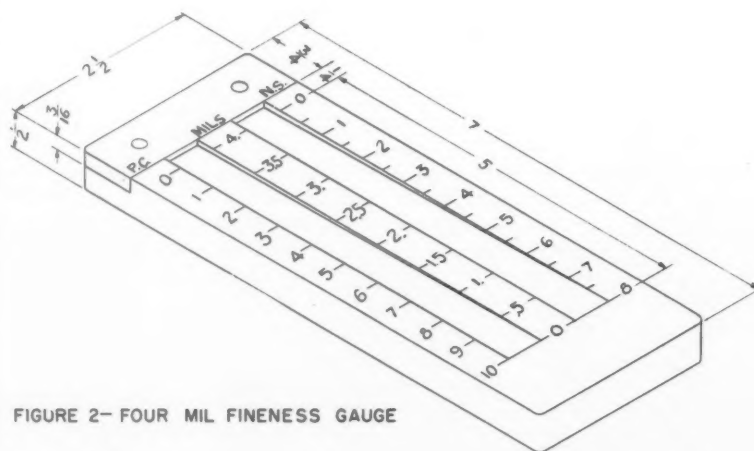


FIGURE 2—FOUR MIL FINENESS GAUGE



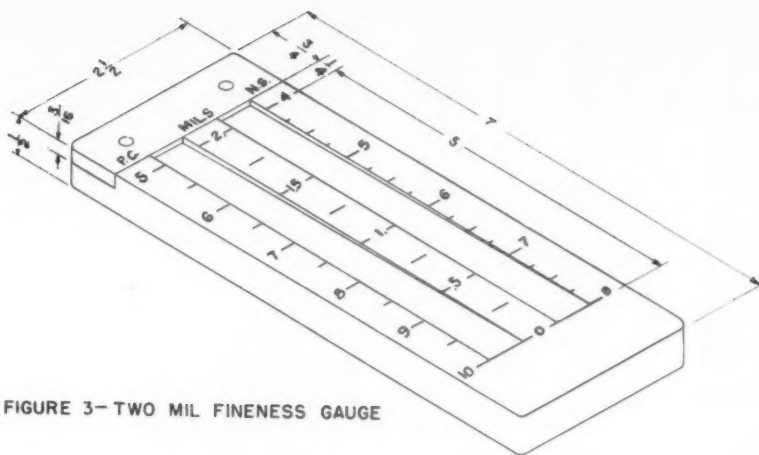


FIGURE 3—TWO MIL FINENESS GAUGE

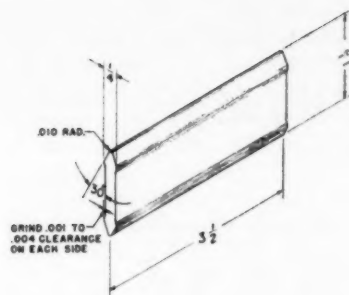


FIGURE 4—DOUBLE ROUND EDGE BLADE

figure 1. This device consists of a steel block and blade. The top surface of the block is ground smooth and contains two parallel ground paths which are one-half inch wide and 2 inches long, being tapered in depth from 0.005 to 0 inches in that length. The top surface of the block and the bottom of the paths must be surface-ground very smooth and true to insure accuracy.

It is also permissible to use the "4mil" and "2mil" gages and applicator described in the *Official Digest, Federation of Paint and Varnish Production Clubs*, 263, December 1946, p. 633, "A Study of Pigment Dispersion, Part I, 'The Measurement of Fineness of Grind,'" by the New York Club. The "4mil" gage is recommended for general use and the "2mil" gage for finely ground enamels. Results should be reported in terms of the North Standards scale. Figure 2 shows the "4 mil" gage, Figure 3 and "2 mil" gage and Figure 4 the double round edge applicator blade.

To determine the fineness of grind of a paint, place in each path, at the deep end, a large drop of paint somewhat exceeding the amount required to fill the entire path. Grasp the blade between the thumb and index fingers of both hands. Place the blade edgewise in contact with the surface of the block at the extreme deep end of the paths, with the long dimension extending across the width of the block.

Hold the blade so that its long dimension is parallel to the end of the block and its short dimension is verti-

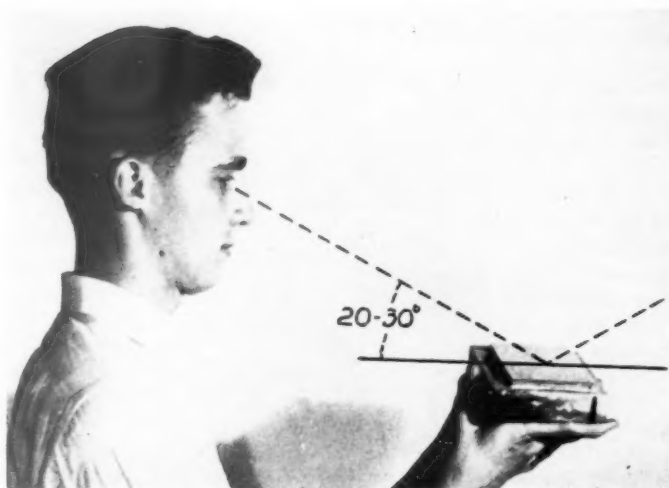
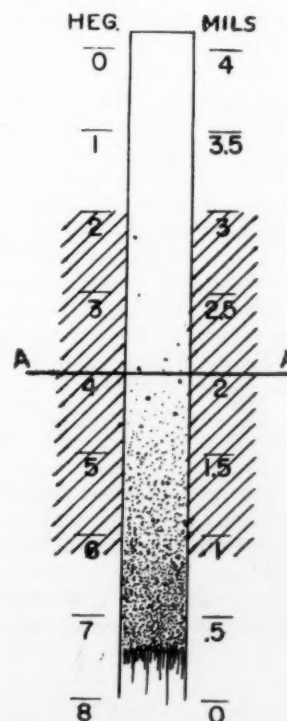


Fig. 5—Viewing Angle  
Courtesy of Sherwin-Williams Co.

Fig. 6—Cross hatching represents range over which pattern was read. A-A represents average.  
Courtesy of Sherwin-Williams Co.



cal to the surface of the block. Draw the blade over the surface of the block from the deep end of the path to the shallow end, at a uniform moderate rate. Maintain the blade in a vertical position during this operation, and continue its motion past the "0" end of the tapered path. (This operation is intended to fill the paths exactly with the paint under test.) Immediately inspect the path along the 0 to 8 scale, viewing at grazing incidence and note the point where the paint in the paths shows a predominantly speckled appearance. Note the number corresponding to the point at which this predominantly speckled appearance begins, and report this number as the fineness of grind. Disregard any scattered specks which appear in the path prior to the point where the predominantly speckled appearance is noted.

The reading must be made immediately after filling the paths with the paint. For this reason, it is often advisable to make a preliminary determination to establish the approximate position of the first appearance of a predominantly speckled surface. A second accurate reading can then be made very rapidly, since the approximate position is already known.

**Coarse Particles and Skins.** (Abridged from A. S. T. M. Designation: D 185-45).

The apparatus shall consist of a 3-in. No. 325 (44-micron) sieve conforming to the Standard Specification for Sieves for Testing Purposes (A. S. T. M. Designation: E 11) of the American Society of Testing Materials. The sieve shall be dried in an oven at 105 to 110 C., cooled, and then weighed on an analytical balance, the weight being recorded to the nearest milligram.

The sample to be tested shall contain 10 g. of pigment (25 g. of pigment with white lead and red lead). The weight shall be determined on an analytical balance to the nearest milligram and the sample transferred to a 250-ml. beaker. With dry pigments and pastes 100 ml. of kerosine shall be added to the beaker; with mixed paints and enamels 50 ml. of kerosine. The sieve shall then be wet on both sides with kerosine. The sample and the kerosine in the beaker shall be thoroughly mixed, breaking up all lumps, but not grinding, with the flattened end of a stirring rod. The contents of the beaker shall then

be transferred to the sieve, using a wash bottle containing kerosine. When small particles of pigment are retained on the stirring rod or walls of the beaker, they may easily be removed with a camel-hair brush.

The sieve shall then be held under an outlet delivering about 300 to 500 ml. of kerosine (siphoned from a vessel) per minute. By slightly shaking the sieve, the pigment will be rapidly carried through. A soft camel-hair brush may be used in aiding the operation. If the sieve is held at a slight angle so that the pigment will gradually collect at one edge during the washing process, and then rotated, the pigment may be brushed out rapidly, with no risk of clogging the sieve. After the most of the finely divided portion of the pigment has passed through the sieve (from 2 min. to 1 hour, according to the kind of pigment), the sieve shall be placed in an 8-in. porcelain dish containing 250 ml. of kerosine. The sieve will thus be covered to a depth of about  $\frac{1}{2}$  inch. The pigment remaining on the sieve shall be brushed with a soft 1-in. camel-hair brush at the rate of two strokes per second during two periods of 10 sec. each. The sieve shall then be raised from the dish after each ten sec. period to let the liquid on the sieve run through. The liquid in the dish should be changed after every two brushing periods. This operation shall be continued until the kerosine passing over the residue and through the sieve is clear and free from solid particles. When the washing appears to be complete, about 200 ml. of the kerosine, after passing over the residue and through the sieve, shall be collected in a clean 400-ml. beaker. The liquid shall be stirred vigorously, and the beaker set on a black surface in the case of colored pigments. The washing shall not be considered complete until such a test fails to show and particles collected about the middle of the bottom of the beaker.

The pigment particles adhering to the brush shall then be washed back onto the sieve and all kerosine shall be washed from the sieve with ether. The sieve shall be dried for 1 hr., cooled, and weighed on an analytical balance, the weight being recorded to the nearest milligram. The percentage of coarse particles and skins shall then be calculated.

In the case of shipbottom paints containing resins and alcohol the procedure described above shall be followed, except that a sample containing 10 g. of pigment shall be used and denatured alcohol shall be used as the wetting medium, for mixing with the paint, and as the wash liquid.

In the case of cellulose ester lacquers the procedure described above shall be followed, except that a sample containing 10 g. of the material shall be used and a mixture of equal parts of ethyl acetate, benzol, and denatured alcohol, shall be used as the wetting medium for mixing with the lacquer and as the wash liquid.

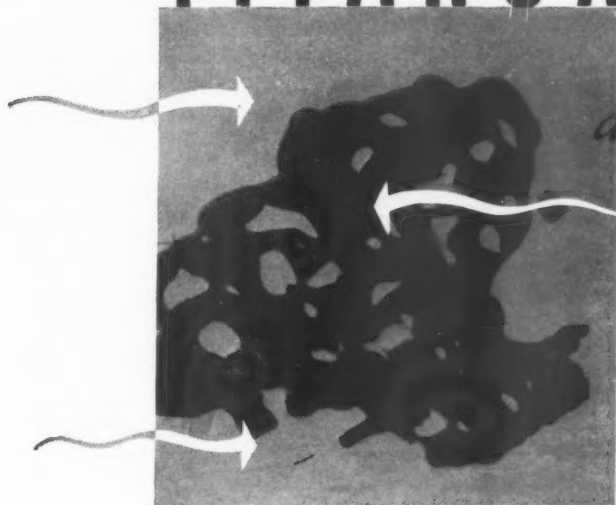
#### Discussion

DOUBLEDAY and Barkman (1) in their study on the fineness of grind gauge found that for grinds of 7 and better there was a significant change in the fineness of grind within ten seconds of the drawdown. For grinds of six or poorer they found little or no change during the first 30 seconds. A viewing angle of 20 to 30 degrees, Figure 5, was learned to be the easiest for obtaining duplicate readings.

These investigators state that variations up to  $1\frac{1}{2}$  units can result from the above factors combined with errors caused by worn gauge blocks and blades, and by incorrect sample reduction. The major cause of discrepancy, however, was a result of interpretation of the grind pattern which varied by 4 to 5 units, Figure 6.

The fineness of grind determination is subject to the same limitations that occur in the preparation of films with a draw down blade in that the thickness of the blade edge used for the draw down influences the wet film thickness of the material deposited in the groove. With the instrument described above, a slight tilt of the scraper blade during the draw down reduces the effective thickness of the blade and makes possible an erroneously high value for the fineness of grind because of the greater film thickness deposited. In actuality, however, tipping of the blade smears the sample and requires a repeated run. The double round edge blade developed by the N. Y. Production Club obviates this diffi-

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Particle of TITANOX-RCHT from which calcium sulfate has been removed by solvent. Note how  $\text{TiO}_2$  retains structure of coating over calcium sulfate.

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Greater than 30,000 X



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Much more than just a simple mixture of pigment and extender that usually settles-out on storage, the extended TITANOX pigments are true composites resulting from the precipitation of titanium dioxide upon finely divided calcium sulfate.

This *coalesced* nature has been positively identified via electron micrographs which revealed calcium sulfate particles "peppered" to thorough coverage by titanium dioxide particles.

The co-precipitated and *coalesced* TITANOX composite pigments embody the best method so far developed for extending rutile titanium dioxide to get the utmost in hiding power, whiteness and its retention, easy wetting and fine dispersion.

Efficient paint production through easy grinding, plus more hiding per dollar and more gallons of paint per pigment dollar are achieved with:

TITANOX-RCHT general purpose—principal use—interior architectural finishes, white house paint.

TITANOX-RCHTX specially processed (but not coated) to yield easier mixing and grinding when needed—same uses as RCHT but especially preferred for gloss finishes.

TITANOX-RC "non-chalking"—principal uses—exterior tinted house paints, trim paints, porch and deck enamels, etc.

Any opportunity to assist you in best adapting these *coalesced* rutile-calcium pigments to your products is welcome at any time. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; 104 South Michigan Avenue, Chicago 3, Ill.; 2600 South Eastern Avenue, Los Angeles 22, Calif. Branches in all other principal cities.

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*the brightest name in pigments*

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culty and furnishes results of equal validity as the flat edge blade.

As the flow and leveling properties of the paint influence the fineness of grind value obtained, an examination immediately after completion of the draw down is necessary to eliminate possible erroneous results. The flow properties along with the general consistency properties of the paint also influence the wet film thickness of the coating deposited. Variations by these factors are increased by varying the time consumed in making the draw down. A heavy bodied paint with poor flow properties will show a lower grind value when the blade is drawn very rapidly than when the blade is drawn slowly. It is suggested that the operator standardize his draw down time when making comparative tests. The statement "One Thousand and One"—the equivalent of one second when spoken distinctly—can be used to control the time for the draw down and allows sufficient time for a smooth operation.

For making the drawdown, the N. Y. Production Club recommends the following technique. "Draw the blade over the surface of the block from the deep end of the paths to the shallow end at a uniform moderate rate. Stay almost at arm's length from the block and move the body

backwards while making the draw-down; keeping the wrists and elbows fairly stiff. Maintain the blade in a vertical position during this operation and continue its motion past the near end of the paths."

#### Miscellaneous Tests

##### Weight Per Gallon (Method 401.1 Federal Specification TT-P-141b).

A specified weight per gallon along with a general composition requirement serves as a rough check for the analyst on said composition. Weight per gallon is also a valuable tool in production control. To obtain a true weight per gallon measurement, it is necessary to use a true, homogeneous sample of the material. The selection of ingredients usually determine the weight per gallon of the paint. The formulation, therefore, controls the property.

The apparatus shall consist of a smoothly finished aluminum, brass or plated cup provided with a snug-fitting, plug type cover having a small hole in its center. The capacity of the apparatus (filled to the top of the hole in the cover) at  $23 \pm 0.5$  C. is 83.2 milliliters  $\pm 0.1$  milliliter. The inside of the bottom of the cup should be rounded. A convenient size for the apparatus is approximately

76 millimeters high by 38 millimeters in diameter; the hole in the cover should be about 1 millimeter in diameter. The tare of the apparatus should be determined or a counterpoise weight should be provided.

Pour the well-mixed paint, previously brought to a temperature of approximately 23 C. into the cup until it is nearly full, put on the cover, press it firmly in place and then wipe off the excess paint that exudes through the hole in the cover. Determine the weight of the paint in the cup in grams. Divide this figure by 10 to obtain the weight per gallon of the paint. The same procedure is used for pastes and semipastes except that particular care must be taken that no air pockets are trapped in the material. If the specific gravity of the material is required, multiply the weight per gallon by 0.12.

##### Adsorption Test (Method 442.1 Federal Specification TT-P-141b).

Fill a one-half-pint friction-top can plug ( $5\frac{1}{2}$  centimeters in diameter) level full with a portion of the thoroughly mixed sample and then place a No. 2 Whatman filter paper (12.5 centimeters is a convenient size) flat on the surface of the liquid with the center of the filter paper approximately over the center of the liquid. Allow to remain at normal room temperature (21 to 32 C.) for 3 hours and then measure the average radial distance on the filter paper from the edge of the area originally "wetted" with the liquid to the farthest extent of the absorption of the liquid.

##### Odor Test (Method 440.1 Federal Specification TT-P-141b).

Note the odor of the material immediately upon opening the container. In addition, a heavy strip of filter paper shall be dipped into the material to be tested. While the filter paper is air drying it shall be examined at suitable intervals for the normal odor of the volatiles specified. The presence of any additional odors shall be regarded and reported as indicating the presence of substitutions or adulterants.

#### Reference

(1) D. Doubleday and A. Barkman, *American Paint Journal*, 34, Nos. 38 and 39 (1950).

#### USUAL REQUIREMENTS

##### Fineness of Grind.

	Not Under
Interior Flat Wall Paints	3*
Interior Semi-Gloss and Gloss Paints	6-7
Exterior House Paints	3
Trim and Trellis Paints	5
Wood and Metal Primers	5
Enamels, Flat	5
Enamels, Semi-gloss	6
Enamels, Gloss	7

##### Coarse Particles.

	Not Over
Interior Flat Wall Paints	2%
Interior Semi-Gloss and Gloss Paints	1-2%
Exterior House Paints	2%
Trim and Trellis Paints	1.5%
Wood and Metal Primers	1%
Enamels, Flat	2%
Enamels, Semi-gloss	1-2%
Enamels, Gloss	0.5%
Pigments in Oil	2%

\* North Standard Values

Table I



## ... HOT LACQUERS

(From Page 10)

spray booths, the air compressing equipment, etc. As a matter of fact, the hot process is of special interest as a means of saving space in crowded factories. There is also some saving in the use of lower proportions of thinner, but this is offset to some extent by the use of higher quality solvents in the hot lacquers. There are a number of other angles to this development, however, and the hot process is of considerable interest in many places where a reduction in the number of spray coats is not in itself of any importance. For example, in the furniture industry lacquers are frequently applied in two coats, and a change to one thicker coat may not be satisfactory there due to the resulting danger of "skippers" and thin-film areas; the hot process still has considerable possibilities there nevertheless. Thus, the lacquer films on furniture are not quite as thick as desired, and the rise in solids which can be produced by spraying the lacquers at the moderately elevated temperature of 130°F may be of considerable interest as a means of obtaining a moderate increase of film thickness without any increase in the number of coats. The process is similarly of interest whenever a moderate increase in opacity is desired. Such a moderate rise in application temperature would also allow the replacement of part of the ¼ sec. and ½ sec. nitrocellulose in furniture lacquers by higher viscosity grades, with a resulting improvement in toughness, durability and cold checking behavior. A third angle: hot lacquers are much less subject to penetration into porous materials than ordinary lacquers and will produce a better "build" on porous woods, and are even of considerable interest on extra porous beaver-board and similar materials.

Incidentally, hot lacquers are totally free from blushing tendencies, partly due to their freedom from the blush-producing low boiling solvents, and partly because they do not cool down to as low a temperature during the spraying as lacquers applied at ordinary temperatures.

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TYPE →	DRYING	NON-DRYING
TRADE NAME	9-11 ACIDS	P-10
CHEMICAL NATURE	9-11 LINOLEIC	RICINOLEIC
MOLECULAR WEIGHT	281	296
COLOR (G-H)	2+	10
NEUTRALIZATION VALUE	193	180
IODINE (WIJS)	150	89

## APPLICATIONS

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ACIDS

Alkyds, driers, in-situ varnishes,  
epichlorohydrin bis-phenol resin  
reactions.

P-10

Alkyds, cosmetics, soaps, grease  
making, pharmaceuticals,  
emulsifying agent, plasticizer  
for allyl starch and Zein.



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In general, the technique of spraying hot lacquers does not differ from that of cold lacquers in any important manner except that the hot lacquer should best be applied at somewhat greater fluid pressures, so as to obtain the extra liquid-film thickness which their use permits. It is also very advisable to use somewhat higher atomizing air pressures—about 10 lbs more—than in the case of cold lacquer; hot lacquers undergo an extra rapid rise in viscosity during the spray operation due to their early cooling, and this makes it necessary to employ somewhat higher pressures if fully satisfactory atomization is to be obtained.

#### References

1. For the benefit of the entire lacquer industry, Commercial Solvents Corp. has dedicated its hot-lacquer process (*U. S. Patent No. 2,150,096*) to the industry so that all may benefit by its free use.
2. The reason for the flow ineffectiveness of the extra slow-evaporating solvents are discussed in detail in "Interpretation of Evaporating Data" by Bogin and Wampner, *Industrial and Engineering Chemistry*, 1937 p. 1012.
3. The Hercules Powder Co. has recently published a summary of the equipment available on the market, under the name of "The Case for the Hot Lacquer Process—#2—An Equipment Story."

#### ... FILTERS

(From Page 13)

cartridge is rotated through a complete revolution, all foreign solids are combed out of the slots between the discs by the stationary cleaner blades.

This is the continuously cleanable, closed system, space type filter that is commonly used on paints and enamels where high grade finishes are required. They are generally installed on circulating lines, dip tanks, flow coaters etc. They have also been effectively used for the straining of paints as they are transferred from storage to shipping containers.

#### Depth Filter

THE second general type of filter, the depth type, is characterized by the fact that a relatively long and tortuous path is offered to the passage of fluids. Solids are stopped by becoming entangled within the mass of the filtering structure. The structure may be a fibre mass, either treated or untreated, a ceramic block; or a precoat.

The simplest depth type filter is represented by a medium made of sheets or bags of paper, felt, or tightly woven cloth. All particles too large

to get through are held back more or less on the surface of the filtering medium. The medium may be made in the form of pleated cartridges, sheets in a press, or bags in a leaf type filter. Very fine filtration is possible with this type of equipment; however, it is generally bulky and somewhat costly to maintain.

The packed or felted type of filtering medium may be basically cellulose, cotton waste, or similar materials, packed or laid to form a filtering bed. This provides a relatively thick mass and unwanted particles are trapped throughout the structure as the fluid is forced through.

An example of this felted fibre type cartridge with certain unique features is shown in figure 3. The basic fibre used in this cartridge is wool. It is felted in such a way as to provide a mass of varying density. The filtering structure is more open where the fluid enters and becomes progressively finer toward the center. The degree of filtration is determined by the felting process which insures controlled porosity. The wool fibres are especially suitable for a filtering medium and the structure is impregnated with a resin bond locking the fibres in position. The graded density of this cartridge is clearly shown in the photomicrograph of a cross section of this cartridge shown in figure 4. It is this variation in density that makes it possible for this type cartridge to hold a maximum of dirt with the larger particles held in the outer layers and the smaller particles being progressively trapped as the fluid moves radially toward the center.

The last type of depth filtration is exemplified by the precoat filter. This type builds up a temporary filtering bed on a supporting structure such as wire cloth, canvas duck, or paper. A filter aid such as certain types of clay, diatomaceous earth, or a special proprietary mixture is mixed in appropriate proportions with the fluid to be filtered. When the mixture is passed through a filter, a cake or bed of the filter aid and the solids to be removed is formed on the supporting structure. The filter aid keeps the cake open enough to pass the liquid but dense enough to stop the filterable material.

This bed must be established before effective filtration can start. This precoat of the supporting struc-

ture is done by circulating the charge long enough to establish the cake and until the desired clarity of filtrate is obtained.

#### Cleaning

IN cleaning the filter, which destroys the bed, the cake is removed from the supporting structure by disassembling the filter and manually stripping the cake. Precoat filters usually require auxiliary equipment such as mixing tanks for adding the filter aid, circulating pumps and change-over valves. They are expensive and bulky and require competent operators. They can, however, perform a very fine clarifying job—in most cases finer than equipment previously discussed. Certain precoat filters can be used at higher temperatures than most paper or fibrous cartridges. They are used principally on clears.

Because of the expense and special equipment involved in the use of precoat filters it is advisable to explore thoroughly the possibility of using a simpler type filter before installing the precoat. In many instances the less complicated unit will give results that are satisfactory.

By this time you may be wondering whether it is worthwhile to get involved in such an apparently complicated procedure as choosing the proper filter. Its value, however, has been proved by the largest manufacturers of finishes particularly such pigmented finishes as high grade enamel.

The protection of a reputation for fine quality high grade finishes is well worth protecting by the investment in the right filter to satisfy your needs. To help you make this choice engineers who represent the filter manufacturers are more than willing to counsel with you and share their knowledge in this specialized field.

#### Glidden Promotions

Elevation of four major executives in the Chemical and Pigment Division of the Glidden Company in Baltimore was announced by John P. Ruth, vice president in charge of the division.

G. M. Halsey, manager of the Baltimore plant for four years, has been appointed to the newly-created post of director of manufacturing for the entire division. He is succeeded by James W. Pollard, Jr., formerly plant engineer. A. J. Benjamin has been advanced to the position of assistant manager, and Irving J. Foote has been named plant engineer.

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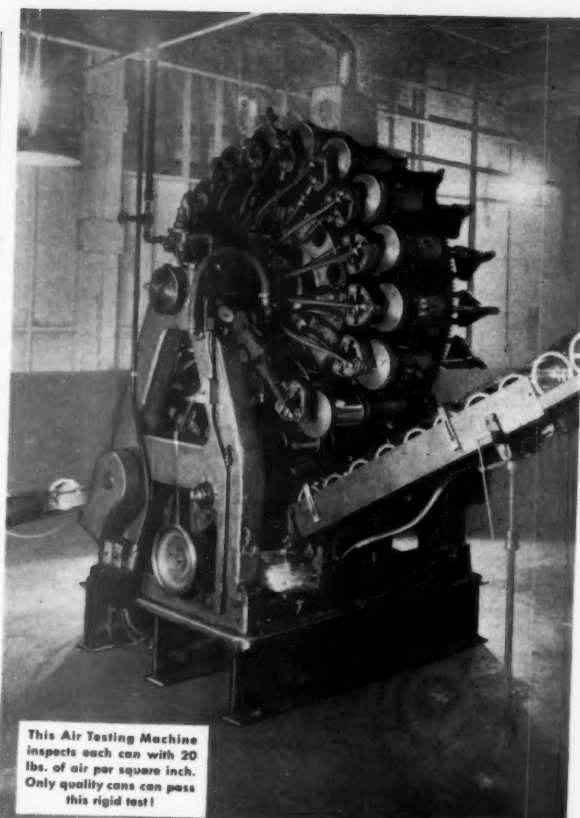


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# PATENTS

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## Stabilizing Polymers

U. S. Patent 2,507,143. Charles J. Chaban, Toledo, Ohio, assignor to Stabelan Chemical Company, Toledo, Ohio, a partnership.

A method of improving the properties of the product of the polymerization of a composition comprising a substance whose molecule contains a polymerizable olefinic double bond that comprises subjecting it to intimate contact with (a) an inorganic peroxide and (b) a salt of a metal of group II of the periodic table having an atomic weight between 85 and 140 with an acid not stronger than metaboric acid, whose one per cent aqueous solution has a pH from about 8 to about 12.

## Polyvinyl Alcohol

U. S. Patent 2,499,924. Edward Lavin, Springfield, Mass., assignor to Shawinigan Resins Corporation, Springfield, Mass., a corporation of Massachusetts.

A process for preparing high viscosity polyvinyl alcohol which comprises hydrolyzing polyvinyl acetate by treatment with a catalytic amount of sulfuric acid while dissolved in a mixture of methanol and a hydrocarbon selected from the group consisting of benzene, toluene, and xylene, said mixture containing 3-25% methanol by weight, and the balance being the hydrocarbon, and continuing the hydrolysis until the ac-reduced to 15-40% by weight calculated content of the polyvinyl acetate is later as polyvinyl acetate.

## Polyvinyl Chloride Coating

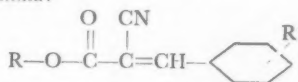
U. S. Patent 2,507,688. Noel Armstrong, Newburgh, N. Y., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware.

A coating composition having a smooth mobile and relatively stable consistency which comprises a finely divided polymer selected from the group consisting of homopolymers of vinyl chloride and copolymers thereof obtained by polymerizing at least 95% of vinyl chloride and up to 5% of a monomer copolymerizable therewith, from 35% to 80% by weight of a liquid plasticizer which is a solvent for the polymer at high but not low temperatures, and from about 10% to 20% by weight based on the total composition of a diluent consisting of 15% to 75% of ethyl alcohol and 85% to 25% V. M. & P. naphtha by weight, the percentage of plasticizer being based on the combined weight of plasticizer and polymer.

## Styrene Polymers

U. S. Patent 2,498,616. William S. Emerson, Dayton, Ohio, assignor to Monsanto Chemical Co., St. Louis, Mo., a corporation of Delaware.

The process of forming a resinous product which comprises heating a mixture of from 50 to 99 percent by weight of styrene and from one to 50 percent of a compound having the structural formula:



wherein R is an alkyl group having from one to five carbon atoms, and R' is a radical of the group consisting of hydrogen and alkoxy having from one to four carbon atoms, and recovering the said resinous product.

## Resinous Composition

U. S. Patent 2,498,533. Ludwig H. Dimpf, Berkeley, Calif., assignor to California Research Corp., San Francisco, Calif., a corporation of Delaware.

A resinous composition comprising the condensation product of (I) a linear condensation polymer formed by the reaction of (a) a cyclohexadiene dicarboxylic acid having conjugated ethylenic unsaturation and (b) a member of the group consisting of the dihydric alcohols, the diamines and the amino-alcohols and (II) a linear condensation polymer formed by the reaction of (c) an alpha, beta, ethylenically unsaturated aliphatic dicarboxylic acid and (d) a member of the group consisting of the dihydric alcohols, the diamines and the amino-alcohols.

## Bituminous Emulsions

U. S. Patent 2,509,574. Paul E. McCoy, San Francisco, Calif., assignor by mesne assignments, to Stancal Asphalt & Bitumuls Company, San Francisco, Calif., a corporation of Delaware.

A method of preparing a quick-breaking, free-flowing, oil-in-water type bituminous emulsion having an A. S. T. M. D-244 demulsibility of not less than about 60%, stable in storage and handling and stable in storage against the incorporation therein of as much as 0.5% by weight of the emulsion of ammonium and alkali metal dichromates, comprising emulsifying a bituminous material in water to produce a quick-breaking bitumen-in-water emulsion and incorporating in the emulsion, at a time before the water and bituminous material cease to be subjected to emulsifying conditions, a small amount of a salt selected from the group consisting of ammonium dichromate and alkali metal dichromates, said bituminous emulsion comprising by weight about 55-70% bituminous material, 30-50% of water and 0.05-0.5% of said salt.

## Polyester Process

U. S. Patent 2,497,968. David W. Young, Roselle and Julius P. Rocca, Linden, N. J., assignors to Standard Oil Development Co., a corporation of Delaware.

The process which comprises reacting a substantially pure methyl dilinoleate with decamethylene glycol in the presence of about 0.3 to 1.0% of zinc dilinoleate having a molecular weight of about 1,000, at a temperature of about 180° C. to 220° C. for a sufficient reaction time to produce a high molecular weight polyester.

## Polymerizing Process

U. S. Patent 2,497,107. Karl H. Weber, Washington, D. C., assignor to Armstrong Cork Co., Lancaster, Pa., a corporation of Pennsylvania.

The process which comprises polymerizing a material selected from the group consisting of an open chain, aliphatic conjugated diene containing 4 to 6 carbon atoms and a mixture of such a conjugated diene with a different copolymerizable compound containing a vinyl radical in an aqueous emulsion in the presence of a polymerization regulator selected from the group consisting of alkyl 11-mercaptyl undecanoate, alkyl 10-mercaptyl undecanoate, and a mixture of alkyl 11-mercaptyl undecanoate and alkyl 10-mercaptyl undecanoate, said alkyl radical having 1 to 4 carbon atoms inclusive.



### Synthetic Wax

*U. S. Patent 2,506,903. Herschel G. Smith, Wallingford, and Troy L. Cantrell, Lansdowne, Pa., assignors to Gulf Oil Corporation, Pittsburgh, Pa., a corporation of Pennsylvania.*

A composition of waxy character comprising a substantially neutral higher fatty monocarboxylic acid ester of a fusible, soluble monoalkylated phenol-formaldehyde condensation product, the higher fatty acid being selected from the class consisting of saturated and monoolefinic fatty acids having at least 8 carbon atoms, and the alkyl substituent of the alkylated phenol having from 4 to 12 carbon atoms.

### Polyvinyl Acetals

*U. S. Patent 2,506,014. Francis Joseph Curtiss, St. Louis, Mo., assignor to Monsanto Chemical Company, St. Louis, Mo., a corporation of Delaware.*

A composition of matter consisting essentially of a polyvinyl acetal resin and a still residue obtained as a by-product in the process which includes the steps of heating a compound taken from the group consisting of benzene and mixtures thereof with toluene and xylene to temperatures at which diphenyls and terphenyls are formed, dis-

tilling the product to remove unconverted material; that boil below 200° C., chlorinating the resultant residue and distilling the chlorinated mixture at 250 to 420° C. to remove therefrom pure chlorinated diphenyls and chlorinated terphenyls, said still residue consisting essentially of chlorinated polyphenyl compounds taken from the group consisting of chlorinated triortho-phenylene and chlorinated diphenyl benzene polymers, said residue having a melting point of from 50 to 250° C. and a chlorine content of 50 to 60%, said composition containing up to 100 parts of still residue per 100 parts of polyvinyl acetal resin.

### Fumaric Esters

*U. S. Patent 2,498,084. Jerome G. Kuderna, Jr., Passaic, N. J., and Robert H. Snyder, Chicago, Ill., assignors to United States Rubber Co., New York, N. Y., a corporation of New Jersey.*

A soluble unsaturated binary copolymer of a di-2-alkenyl fumarate selected from the class consisting of diallyl fumarate, dimethallyl fumarate, and di(2-chloroallyl) fumarate and a chlorinated-alkene having from three to four carbon atoms prepared from a mix in which the said alkene ranges from 10-500% by weight based on the weight of the fumarate.

### Modified Melamine Resins

*U. S. Patent 2,508,875. Milton J. Scott, Springfield, Mass., assignor to Monsanto Chemical Company, St. Louis, Mo., a corporation of Delaware.*

A surface coating resin comprising the heat-reaction product of a methylol melamine-alcohol condensation product with an aryl sulfonamide taken from the group consisting of benzene sulfonamide and ring-substituted benzene sulfonamides wherein the substituent is an alkyl group, the ratio of said aryl sulfonamide to chemically combined melamine varying from 0.1 to 1 mol per mol of melamine.

### LANCASTER, ALLWINE & ROMMEL REGISTERED PATENT ATTORNEYS

Suite 424, 815-15th St., N.W.  
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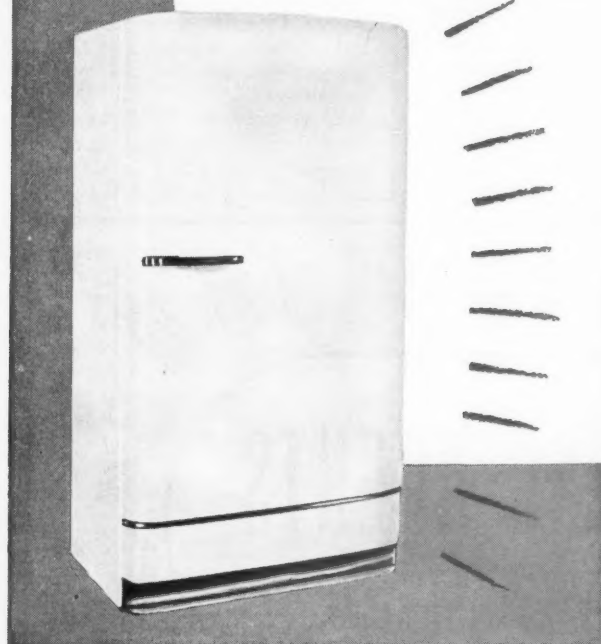
**WHITE**

AND ALKYDS MADE WITH



**PHTHALIC  
ANHYDRIDE**

**KEEP IT THAT WAY!**



The superior purity of Barrett\* phthalic anhydride makes its use especially desirable in the manufacture of better alkyd coatings where whiter finishes and perfect colors are required.

In the solid state, Barrett Phthalic anhydride has a pure flat white color with no tints of any primary color. This color is retained indefinitely.

In the molten state, Barrett phthalic anhydride is practically water-white or colorless, well within the limit of the standard specification of 55-Hazen established by the industry. In actual tests, it has

remained within the limit of 55-Hazen when kept molten for more than 60 hours—a period of time well beyond any normal requirement for processing in plant kettles.

Barrett phthalic anhydride is shipped in 5-ply paper bags, even net weight 80 lbs.; and in light wooden barrels, even net weight 275 lbs.

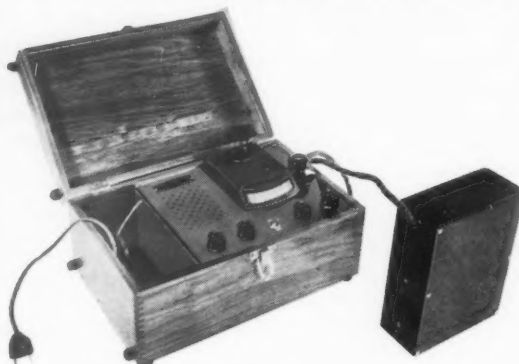
We have prepared an interesting and most useful 48-page illustrated booklet entitled "Phthalic Anhydride." We will be happy to send you a copy with our compliments upon request.

**THE BARRETT DIVISION**

ALLIED CHEMICAL & DYE CORPORATION  
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In Canada: The Barrett Company, Ltd., 5551 St. Hubert St., Montreal, Que.  
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Photoelectric GLOSSMETER



For reliable gloss measurements according to ASTM D523-49T on paints, varnishes, and lacquers

Also for

- Tristimulus Colorimetry with 3 Filters
- Sheen Measurements at 85 Degree Incidence
- Dry Hiding Power and Infra-Red Reflectance

in accordance with Federal Specifications TT-P-141b

**Portable, rugged, simple to operate**

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✓ LACQUER  
✓ VARNISH  
✓ ENAMEL  
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BLACKS**

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*Use*

**UNITED CARBON COMPANY, INC.**

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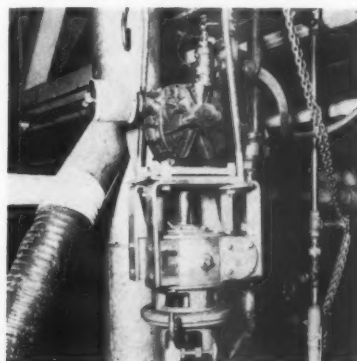
NEW YORK AKRON CHICAGO BOSTON

CANADA: CANADIAN INDUSTRIES, LIMITED



# NEW PRODUCTS & IMPROVEMENTS NEW

A MONTHLY MARKET SURVEY



Leiman Bros.

## AIR MOTOR

### Variable Speed

Air motor provides variable speed power source for a laboratory agitator plus being spark-proof and splash-proof. The use of a Leiman air motor allows instant and economical variable speed control. As the viscosity of the agitated liquid increases the agitator r.p.m. are kept constant by merely increasing the air pressure. The particular application shown was made in the laboratory of a prominent New Jersey plastics manufacturer. From the safety angle, the use of an air motor is always advisable wherever inflammable vapors, dust, gases, etc. are present and the use of an electric motor or gasoline would be dangerous. Leiman Bros., Inc. 31-G Christie St., Newark 5, N. J. PVP—October.

## WATER BATH

### Adjustable Regulator

Water bath is fitted with a precision-built, adjustable thermo-regulator and controls to maintain a temperature of 77 degrees F.  $\pm 0.2$  degree F. for use with Gardner Bubble Viscometer Tube. Henry A. Gardner Laboratory, Inc., 4723 Elm St., Bethesda, Md. PVP—October.

## PUMPS

### Self-priming

Positive self-priming, no large and bulky priming reservoir, no recirculation of water during pumping stage, and efficiencies comparable to standard centrifugal pumps are the feature of these pumps, according to the manufacturer. Made in sizes from  $\frac{1}{4}$  h.p. to 5 h.p., open and closed impellers. Capacities to 120 G.P.M. and heads to 135 feet depending on capacity. Suction lifts up to 25 feet. Goulds Pumps, Inc., Seneca Falls, New York. PVP—October.

## CLEANING MACHINE

### Removes Accumulation on Floors

Floor cleaning machine is equipped with wire brushes, which are made in several styles for specialized work, that "grind" accumulation of various kinds on floor surfaces. It is especially adapted for removing accumulations from mixing, grinding, and filling room floors in paint and varnish plants. This machine uses two discs or brushes rotating in opposite directions and driven by a  $1\frac{1}{2}$  h.p. electric motor. A reversing switch is built into the motor so the direction of rotation of brushes can be changed, thereby constantly presenting a sharp cutting edge to the floor. Lincoln-Schlueter Floor Machinery Co., 1250 W. Van Buren St., Chicago 7, Ill. PVP—October.

## PLASKON RESIN

### For Appliance Finishes

Plaskon 3101 is recommended for formulating vehicles for white baking enamels. According to the manufacturer, this resin has unparalleled soap resistance and color retention. For further details, write to Plaskon Div., Libbey-Owens-Ford Glass Co., Toledo 6, Ohio. PVP—October.

## ISOCYANATES

### Paint Intermediate

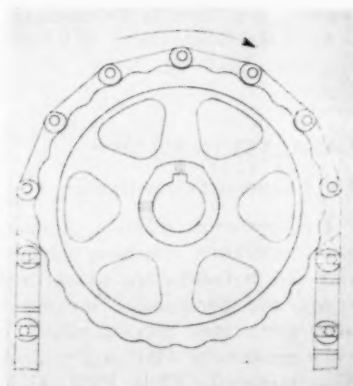
A series of isocyanates are now available. These have found to be of increasing value in paint, rubber, and plastics. Monsanto Chemical Co., St. Louis 4, Mo. PVP—October.

## TRACTION WHEEL

### For Bucket Elevators

This drive wheel, provides longer service, increases chain life, insures against chain breakage due to overload, affords safer operation and lowers maintenance costs, according to the manufacturer.

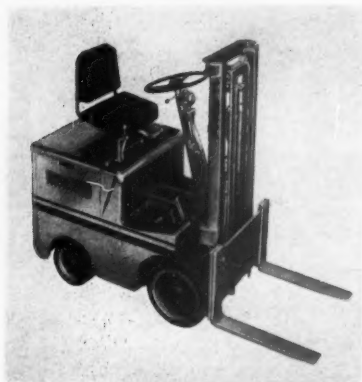
Beaumont "Trac-Pull" wheels combine the advantages of the conventional sprocket and traction wheels and eliminate certain disadvantages inherent in these types. Designed with "corrugations" on the rim, rather than with teeth as used on sprocket wheels or with smooth rims as used on conventional traction wheels, it is said that these wheels will not jam and break the chain and will not slip when load conditions do not exceed the maximum specified by the manufacturer. Beaumont Birch Co., 1505 Race St., Philadelphia 2, Pa. PVP—October.



Beaumont Birch



## NEW PRODUCTS



Clark Equipment

### GAS CARLOADER

#### With Dynatork Drive

Dynatork drive on carloader increases as much as 20 percent the amount of work a fork-lift truck can do, according to the manufacturer. It eliminates jerks, repeated shifting of gears when operating in close quarters. There is no friction-type clutch and the conventional transmission is replaced by constant mesh, 2-speed forward-and-reverse gearing. Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich. PVP—October.

### COLORANTS

#### For All Coatings

The "Tint-A-Matic" system is made up of 24 color tubes, yet tints and shades procurable through intermix are practically unlimited. These color cubes are adaptable for use in eight different types of paint, including house paint, wall paints in flat, gloss or semi-gloss, brick and cement paint, furniture enamels, trim and trellis finishes, and floor and deck enamels, according to the manufacturer. Rahr Color Clinic, 9 E. 56th St., New York 22, N. Y. PVP—October.

### CATALYST

#### For Emulsion Polymerization

Hydroperoxide solution promotes low-temperature emulsion polymerization of butadiene and styrene with redox and peroxamine recipes. It also accelerates polymerization of vinyl monomers. Phillips Petroleum Co., Bartlesville, Okla. PVP—October.

### PAINT STRIPPER

#### Use Hot or Cold

Loncoterge #2063 strips and cleans surfaces of baked-on acid- and alkali-resistant finishes and also removes carbonized films. Stripper may be used hot or cold. A 50% dilution strips at a speed only slightly less than when used straight. When used hot, most finishes are removed in 2 to 5 minutes. Maximum stripping action of Loncoterge #2063 is attained within temperature range of 155 to 225 degrees F. London Chemical Co., 607 S. Dearborn St., Chicago 5, Ill. PVP—October.

### END DUMPS

#### With Wheels

The units may be handled by platform or fork truck, and the wheels give convenience of movement in crowded plant areas and narrow aisles. Two wheels are stationary and two are swivel casters. Dumping is simplified by a rocker geared to a track. A safety latch locks during loading. The dumps are built of heavy steel plate reinforced with angles and channels, and are of all-welded construction. Customers may specify size and capacity. Palmer-Shile Co., 12663 Mansfield St., Detroit 27, Mich. PVP—October.

**Over 90 Years...**

serving Paint Manufacturers with

**Quality Paint Grinding Vehicles!**

**MCCLOSKEY'S**

**No. 10615**

**WHITE ENAMEL LIQUID**

We feel confident in recommending our No. 10615 WHITE ENAMEL LIQUID. You will be quick to grasp the advantage of an enamel made from this liquid. No. 10615 is a perfect vehicle for manufacturing an enamel which has a buttery-like consistency, brushes very freely, dries hard overnight, stays put and levels out satisfactorily.

Non-yellowing and gloss retention tests show this vehicle to be unusually fine in both regards. Enamels made therefrom have excellent whiteness and practically no after-yellowing on age.

*Write for finished sample and formula for making.*

**MCCLOSKEY VARNISH CO.**

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## NEW PRODUCTS

### MICROPHOTOMETER

#### High Sensitivity

Light-scattering microphotometer which measures 20 micro-lumens of scattered light, has a sensitivity approximately 100 times greater than similar instruments.

It may be used with any of the accepted techniques for molecular weight, particle size, microfluorescence, depolarization, dissymmetry, and microturbidity measurements. Its high sensitivity opens new fields in the measurement of optical-glass scattering power and in microchemical turbidity analyses.

The new instrument is portable and completely a-c operated. It employs two built-in electronic-regulated power supplies, also a d-c amplifier which operates the panel microammeter and which may be connected directly to an external recorder. Full scale deflections of the panel microammeter are made with photomultiplier tube currents of 10, 1, .1, and .01 microamperes. Details are given in Bulletin 2182, obtainable from the manufacturer, the American Instrument Company, Inc., Silver Spring, Maryland. PVP—October.

### DRUM AGITATOR

#### Hand & Power Operation

One of the primary features of the new American-Ingraham agitator is the unique driving spud on the end of the agitator bar which makes it adaptable to either power or hand operation. It is also said that this agitator is highly efficient and will produce a laboratory mix in as little as ten minutes. This efficiency is due to the fact that the various planes of the agitator bar are turned at angles, which, when in motion, raise the settled material from the bottom of the drum and mix it through the entire contents. This bar also provides a sweeping arm and chime-scraper which loosens material from the bottom and the hard-to-get-at chime of the drum.

For information on the new American-Ingraham Agitator, write to the American Pulley Company, 4200 Wissahickon Avenue, Philadelphia 29, Pa. PVP—October.

### PORTABLE GLOSSMETER

#### With Constant Voltage

New Glossmeter measures 85 degree specular gloss according to Method 611.1, Federal Specification TT-P-141b. The instrument consists of an exposure head with lamp, lens and sensitive light meter in essentially the arrangement employed in the new Gardner 60 degree Portable Glossmeter. With this head is a power supply that may be either a transformer or a battery. This unit has been designed especially for the measurement of sheen of interior wall paints and camouflage paints. Henry A. Gardner Laboratory, Inc., 4723 Elm St., Bethesda, Md. PVP—October.

### RUBBER BUCKETS

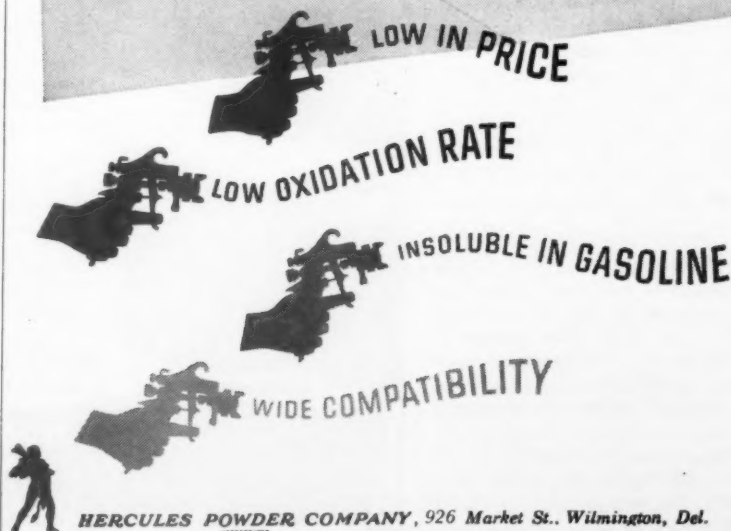
#### For Corrosive Liquids

Unbreakable bucket for carrying corrosive chemicals is made of Enrup, a new thermosetting blend of plastic and rubber. According to the manufacturer, this material will resist aliphatic solvents, all concentration of alkali, most acids and other corrosive liquids up to temperatures of 150 degree F. They are not designed for carrying formic, glacial acetic or concentrated nitric and sulphuric acids. They are not recommended for aromatic solvents, esters or ketones. United States Rubber Co., Rockefeller Center, New York 20. PVP—October.

## Vinsol® Resin

# DOES Cut Costs!

If you make dark colored lacquer or varnish formulas, you can save money on resin costs with Hercules "Vinsol", a dark-colored, high-melting resin. Toughness, flexibility, or hardness can be governed by the ratio of "Vinsol" to film-former and plasticizer. And "Vinsol" is compatible with many film-formers, including nitrocellulose, ethyl cellulose, cellulose acetate, and chlorinated rubber. Send for generous test sample and new booklet, "Vinsol in Protective Coatings".



## NEWS DIGEST



Donald Roan

### Donald Roan Elected Vice-Pres. of Nuodex

Mr. Donald Roan, formerly assistant to the president, has been elected a vice-president of Nuodex Products Co., Inc., Elizabeth, N. J., specialty chemical manufacturers, at the semi-annual meeting of the board of directors. Mr. Roan, in his new position, will be responsible for integrating new projects in manufacturing, sales and research throughout the company and its affiliates.

### Blake Paint Corp. Formed

Formation of Blake Paint Corporation was announced recently by its president, Dudley B. Blake. Offices are at 103 East 125 Street in New York City.

Organized to supply industrial finishes, Mr. Blake stated that "personalized service" would be rendered to manufacturers of metal, wood and plastic items who use lacquers, synthetics, enamels, varnishes, thinners, wrinkle and hammer finishes and vinyl coatings.

In addition, a full line of house paints for interior and exterior use will be sold to paint distributors and dealers throughout the country.

### Dow Completes Two Latex Plants

Completion of two latex plants has been announced by Donald L. Gibb, manager of the plastic sales division of Dow Chemical Co., Midland, Mich. A new plant at Freeport, Texas and the rebuilt plant at Midland have started production. The Midland plant was severely damaged by fire some five months ago. The addition of the Texas plant will double the capacity of Dow's latex production.

### D. H. Mott Named Technical Dir. at Bristol Lacquer

Mr. Fred J. Gentile, president of the Bristol Lacquer and Chemical Company at Forestville, Connecticut, has announced the appointment of Douglas H. Mott to the post of technical director in the firm. Speaking of Mr. Mott's appointment, Mr. Gentile remarked, "Mr. Mott's technical knowledge of paint chemistry will render invaluable service to the paint-buying public."

### Havens Appointed Calco Pigment Pacific Coast Manager

F. B. Havens, formerly technical field service representative, Pigment Department, American Cyanamid Company, Calco Chemical Division, has been appointed Pacific Coast Regional Manager.

### Commercial Solvents Names Three New Directors

Leroy A. Lincoln, president of the Metropolitan Life Insurance Company, Arthur B. Lawrence, senior partner of F. S. Smithers & Co., and Henry V. B. Smith, partner of H. J. Baker & Bro., have been elected to the board of directors of Commercial Solvents Corporation.

### Chase Drier Names New York, New Jersey Representative

Chase Driers & Chemicals Division of Industrial Lining Engineers, Inc., Pittsburgh 1, Pa., announces the appointment of C. E. Schott Co., Inc., 555 77th Street, Brooklyn, New York, as its sales agent and distributor in Metropolitan New York and New Jersey areas.

## Formulate your Aluminum Paint

with MD 565W ALUMINUM PASTE

and provide these 3 big advantages to your petroleum industry customers—

- **LOWER EVAPORATION LOSS**  
—It reflects heat to a higher degree than standard paste pigments.
- **LESS FREQUENT PAINTING**  
—Due to its greater degree of whiteness, color change is at a much lower rate—resulting in reduced maintenance costs.
- **IMPROVED APPEARANCE**  
—It produces a whiter, brighter finish with a minimum of high-lighting and spotty glare.



These and other advantages of this unique aluminum pigment are of unusual interest to all users of aluminum paint. They are of particular advantage to the petroleum industry.

There's a real profit-making story which you can build around your Aluminum Paint, when you formulate with MD 565W ALUMINUM PASTE. Moreover, you pay no premium for this pigment.

We will gladly provide your sales department with further data to capitalize on increasing consumer interest. WRITE TODAY.

**METALS DISINTEGRATING COMPANY, INC.**  
Elizabeth B • New Jersey

**ALUMINUM PASTES  
ALUMINUM POWDERS  
GOLD BRONZE POWDERS**

Since 1916



Sam Ruggeri

### Lacquer & Chemical Names Ruggeri Project Engineer

Irving Flaumenhaft, president of the Lacquer and Chemical Corporation, announces the appointment of Sam Ruggeri as Project Engineer.

Mr. Ruggeri was formerly with Centro Research Laboratories where he conducted extensive research and development in the field of tropicalization of materiel and the development of specifications for moisture and fungus proofing materials for the Bureau of Ordnance of the U. S. Navy.

Under Mr. Ruggeri's direction, the Lacquer and Chemical Corporation plans to become a supplier for all types of coatings and related formulations designed to protect materiel against the effects of moisture and fungus deterioration. He will also direct research and development in connection with changes in old and new Government Specifications Finishes.

### ACS Paint Div. Officers

At the recent 118th National Meeting of the American Chemical Society, the Division of Paint, Varnish and Plastics Chemistry elected the following officers:

**Francis Scofield** of the Scientific Section of the National Paint, Varnish and Lacquer Association was named chairman-elect for the ensuing year.

**H. F. Payne** of the American Cyanamid Co. was re-elected secretary-treasurer.

**D. C. Lewis** was elected a member of the Executive Committee.

**Dr. E. E. McSweeney** of Battelle Institute who has served as chairman-elect for the past year automatically becomes chairman of the Division.

### N. Y. U. Paint Symposium

The third annual varnish and paint chemistry symposium will be held at New York University, College of Engineering, Bronx, N. Y. on Saturday, Nov. 18, 1950. This symposium is sponsored by the College of Engineering, New York Paint and Varnish Production Clubs and New York Paint, Varnish and Lacquer Association. Dr. Max Kronstein is in charge of the all-day meeting. Papers to be delivered at this meeting are:

"Comparative Oxidation of Drying and Semi-drying Oils" by P. S. Hess and G. A. O'Hare of the Congoleum-Nairn, Inc.

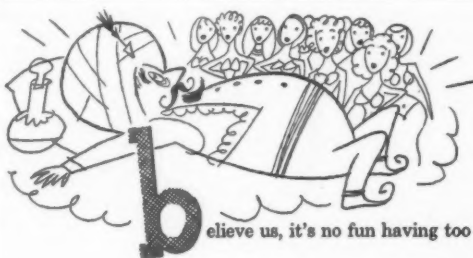
"Further Investigations on Solid State of Film-Forming Materials" by Dr. Max Kronstein.

"Mildewing of Paints and Its Prevention" by Richard E. Vicklund and Milton Manowitz, U. S. Engineer Research & Development Laboratories.

The afternoon session will be a colloquium on "Protection of Submerged Surfaces". This part of the program will be introduced by Frank LaQue of the International Nickel Corp.

### Thomas O'Dwyer Representing Nuodex Products in Midwest

Thomas J. O'Dwyer, formerly Midwest district manager for the Chemical Division of the Celanese Corporation, has been appointed to represent Nuodex Products Co., Inc. in the middle western area. He will handle the complete line of Nuodex materials for the protective coatings field including driers, wetting and grinding aids, and fungicides.



believe us, it's no fun having too much business.

We're swamped with orders—a dazing, devastating deluge. This is not due to war orders but to an accelerated rate of industrial and consumer buying.



Naturally, our regular, old-time customers come first. But, alas, everybody is out after us for material.



No one dislikes this embarrassing situation more than we do. We hope it won't last very long.



Our production men are working themselves to a frazzle to increase output. More material will be coming your way. Meanwhile, remember that we are treating everyone as fairly as possible.



Remember, too, that we love you. For being angels of understanding and cooperation, we think you deserve a halo.



INDUSTRIAL CHEMICAL DIVISION  
**COMMERCIAL SOLVENTS  
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17 East 42nd Street, New York 17, N. Y.



# TECHNICAL

Bulletins

## WITCO REPORTS

Witco Chemical Co. of 295 Madison Ave., New York 17, N. Y. has issued the following reports:

Report G-2 on Aluminum Octoate, Report M-7 on Wettable Zinc Stearate #10, Report M-8 on Calcium Stearate #40, Report P-9 on 6% Cobalt Octoic Drier, Report P-10 on 6% Calcium Naphthenate, Report P-11 on 8% Zinc Naphthenate, and P-12 on 6% Iron Tal-late.

## PHOSPHATE COATING

Touch-up Granodine is the title of a new descriptive sheet issued by American Chemical Paint Co. on zinc phosphate coating and its application in the finishing industry. American Chemical Paint Co., Ambler, Pa.

## FILTERS

Eight-page folder contains specific information on the use of Titeflex filters and their applications in various chemical industries. Operation methods together with drawings of the various units and parts are also included. Copies may be obtained from Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N. J.

## BLENDERS

Four-page folder describes the twin shell blender for mixing dry solid materials. Tables containing general dimensions and drive data are given. Typical mixing and blending tests of various materials are neatly described through drawings and charts. The Patterson-Kelley Co., Inc., East Stroudsburg, Pa.

## PLIOLITE LATEX

Pliolite Latex 170 is described in this technical bulletin issued by the Goodyear Tire and Rubber Co., Chemical Div., Akron, Ohio. Properties, compounding and uses of this resinous dispersion are covered in this bulletin.

## VINYL PLASTICIZER

Solubility, compatibility, and physical properties of "Panaflex BN" plasticizer for vinyl chloride and copolymer resins are covered in an 8-page bulletin issued by the Pan American Chemicals Div., Pan American Refining Corp., 122 E. 42nd Street, New York 17, N. Y. are covered.

## MIXERS

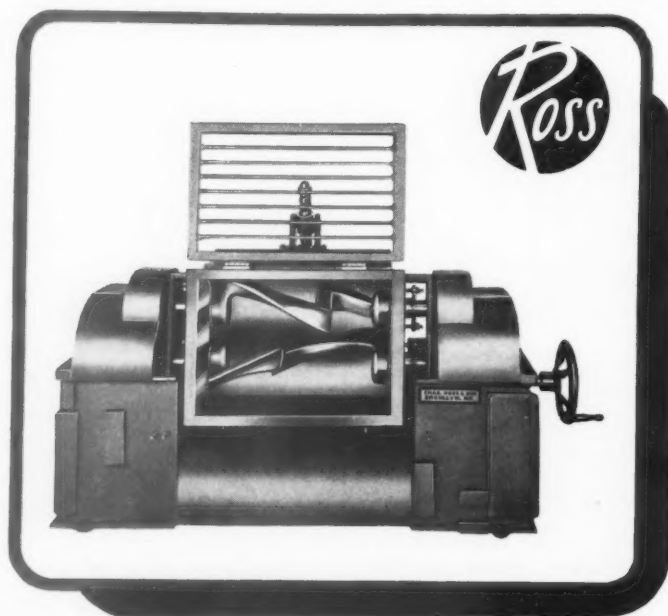
Vertical and horizontal mixers are illustrated in a 24-page bulletin published by Mercer-Robinson Co., Inc., 30 Church St., New York 7, N. Y. These mixers are recommended for pre-blending resinous materials with plasticizers.

## POLYESTER RESINS

Physical properties and compounding instructions and data for a series of polyester resins are described in a 21-page booklet issued by Rohm & Haas Co., Washington Square, Philadelphia 5, Pa. Methods of laminating, molding, casting, caulking, impregnating and suggested uses of these resins are also given.

## VISCOMETER

Description and principle of operation of the synchro-lectric viscometer for use in the laboratory and plant are described in this four-page folder. Brookfield Engineering Laboratories, Inc., Stoughton, Mass.



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## YELLOWING STUDIES

Technical Bulletin No. 4 issued by the Wet Ground Mica Association, Inc., 420 Lexington Ave., New York 17, N. Y. contains Studies on the Yellowing of Alkyd Paints Having Various Pigmentation. This study is the result of the current research program at the College of Engineering, New York University, on the use of wet ground mica as an extender in paints. During this research the question arose as to how the yellowing of the paint film, which appears during extended heating, could be compared successfully. The fact that alkyd paints show this effect in the course of baking at relatively high temperatures was known, but the comparative yellowing of paints having various pigmentation and various extender materials was not known. The bulletin discusses test method used, types of paints and pigmentations used in the study, and results of the experimental work together with conclusions.

## MATERIAL HANDLING

A series of material handling case studies has been made by field men of The Rapids-Standard Company, Inc., Grand Rapids, Michigan. These four-page folder field reports outline the problem and solution of specific applications. Result of new methods are given in statistical form. In many cases a floor-plan drawing is included. All reports show installation photographs with descriptive captions. The Rapids-Standard Company, Inc., 342-5 Rapistan Bldg., Grand Rapids, Michigan.

## FIRE SAFETY

The Solvay Sales Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y. has recently published a 23-page pocket-sized booklet entitled "Stop Small Fires from Growing Up." This booklet describes the use of calcium chloride in fire fighting equipment and shows how it may prevent freezing, evaporation and fouling.

## KEL-F DISPERSIONS

Two series of non-aqueous dispersion Kel-F are described in this 6-page bulletin. Property and application information are included. M. W. Kellogg Co., Chemical Manufacturing Div., 225 Broadway, New York, N. Y.

## ORGANIC CHEMICALS

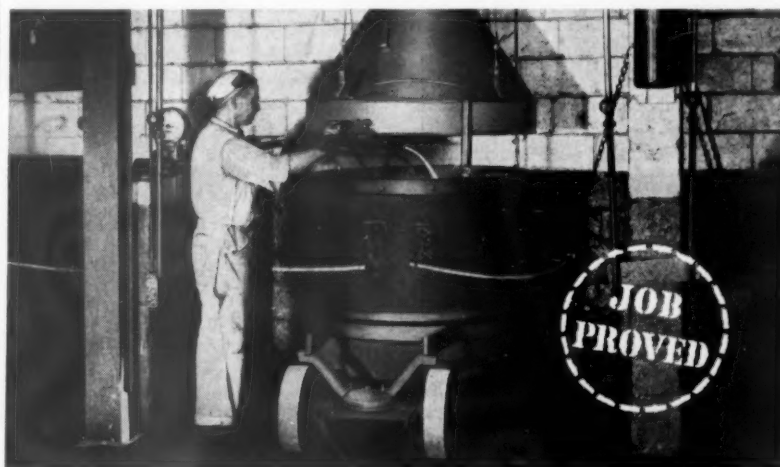
The 1951 edition of the booklet, "Physical Properties of Synthetic Organic Chemicals," has just been issued by Carbide and Carbon Chemicals Division, Union Carbide and Carbon Corporation. This 16-page booklet is a condensed guide for users of organic chemicals. It presents data on applications and physical properties of more than 250 synthetic organic chemicals in tabular form for ready and easy reference. Copies may be obtained without charge by writing to Carbide and Carbon Chemicals Division, 30 East 42nd Street, New York 17, N. Y. Ask for Form 6136.

## OILS & RESINS

Manual lists useful oils and resins for the paint industry. Description, uses, specifications and recommended driers are given for alkyd resin solutions and solid resins. Properties of processed fish, linseed and soya oils are also included. Crown Oil Products Corp., 2-14 49th Ave., Long Island City, N. Y.

## METERING PUMPS

The uses and various features of the Robinson No. 6100 Metering Pump are described in this bulletin recently published by Edward E. Robinson, Inc., 95 Park Ave., Nutley, N. J.



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# abstracts



## Instrument Simplifies Corrosion Study

*Presented at Annual Conference of the Chemical Institute of Canada, Ottawa.*

A new instrument that simplifies the laboratory study of galvanic corrosion and is useful in the study of metals and alloys for the aircraft and automobile industries was described by Dr. Hugh P. Godard of Aluminium Laboratories Limited, Kingston.

Galvanic corrosion occurs at joints between different metals and its study is of extreme practical importance because of the complexity of modern machines such as aircraft, automobiles and ships, he said. In the laboratory the study of galvanic corrosion is often difficult and wrong answers may be obtained unless the work is carefully done. This new instrument simplifies the laboratory study of this type of corrosion, he claimed.

Dr. Godard gave examples of the utility of this new instrument. These included its use in the selection of light alloys for aircraft, the choice of valve metals for aluminum beer barrels, and the study of alloys for automobile cylinder heads.

## Inositol-Linseed Fatty Acid Drying Oils

*Gibbons, J. P. and Gordon, K. M., Industrial Engineering Chemistry 42(8): 1591-1594, 1950.*

This paper describes experimental work which had the intention of preparing a drying oil with properties superior to linseed oil for the purpose of partially replacing the scarce tung oil. A synthetic drying oil was prepared from inositol and linseed fatty acids. As the molar ratio of reactants is decreased, from 6:1 (Linseed fatty acids inositol there is increased development of color, high viscosity and lower acid number. It is believed that esterification of inositol by linseed acids proceeds preferentially to the hexa-esters regardless of the molar ratio of reactants. At 293 degrees C and 310 degrees C the rapid increase in viscosity above five poises is suggestive of oiticia and tung oil bodying characteristics. Varnishes prepared from inositol drying oil and Bakelite soluble resin BR-254 have good drying time and good water and alkali resistance.

## Effect of Driers on Wood Oil-Stand Oil

*Dr. F. Wilborn. Presented at the First General Meeting of the Paint and Varnish Committee of the Chamber of Technology, Berlin.*

Dr. Wilborn discussed a series of experiments conducted at the *Organa, Fahlberg-List, Magdeburg*. These tests were carried out with 1% wood oil-stand oil boiled oils containing precipitated resins of cerium, cobalt, copper, iron, manganese, nickel, lead, thorium and zinc. The drying periods of these products applied in form of thin films on glass panels and subjected to the influence of daylight were determined in the usual manner. The results of these tests confirmed the strong drying effect of the iron resinate first determined by *Quincke and Kamphausen*. The degree of drying influence was found to be the following (best to poorest):—

Cobalt, iron, cerium, copper, manganese, thorium, nickel, lead, zinc.

The tests were then repeated in an exactly identical manner in the dark, the order of the drying effects now being the following:—

Cobalt, cerium, copper, manganese, thorium, iron, nickel, lead, zinc.

These results indicate that the drying properties of the wood oil-stand oils siccated with iron resinate depend very much on the influence of daylight; the cerium boiled oils appear to be practically independent of daylight, cobalt resins prove best under all conditions, while nickel-, lead- and zinc resins made the poorest showing.

The tests were then extended to combinations of two metal resins. These combinations in wood oil-stand oil exhibited a high degree of similarity with the same combinations in linseed oil-boiled oils. As a result of earlier investigations Dr. Wilborn and his co-operators were able to determine a rather sharply defined difference between certain groups of combinations in linseed oil-boiled oil, the two out-

standing groups being the manganese-cobalt group and the lead-thorium-cerium group of siccatives. Practically the same kind of grouping exists in the wood oil-stand oil boiled oil mixtures. In the case of the manganese-lead combinations, the optimum ratios were found to be 1:4 the same as in the corresponding linseed oil combinations.

Another fact confirmed by these recent tests, the same as by the earlier linseed oil combination tests, is that the metals of a group do not always react the same at all times, especially with regard to the effect of daylight. While, for instance, iron resins show definite relations with the manganese-cobalt group in the dark, they react less definite in this direction under the influence of daylight.

Referring to the influence of the percent quantities of driers within the wood oil-stand oil mixtures, Dr. Wilborn found the same hyperbolic dependence as that determined by Dr. Eibner and Dr. Pallauf for the linseed oil products.

## Interesting Aspects in Binding Plasticizers to Euclloids

*Dr. C. Thinius. Presented at the First General Meeting of the Paint and Varnish Committee of the Chamber of Technology, Berlin.*

The mechanical admixture of substances generally known as plasticisers to the Euclloids, a process termed "external plasticizing," represents a reaction influenced by a number of secondary valencies.

In the case of the kind of plasticity typical of a solid solution of polyvinyl chloride in plasticiser the latter is present in a different condition. Part of the plasticiser is quite rigidly combined with the polyvinyl chloride by secondary valencies, while the remainder of the plasticiser is combined within the outer sphere of the solvation complex without the intervention of these secondary valencies. In the case of a dipole-less fluid of unsymmetrical structure—benzenes—only this latter part can be removed by extraction, while solutions of even a comparatively small dipole are able to break up the secondary valency combination, permitting complete separation of all the plasticiser.

Dipole-less solutions of spherical molecular construction or of benzol-ring-structure are also able in some instances to completely break up the secondary valency combinations. It is thus possible to obtain a gradual arrangement (or classification) of the rigidity of secondary valency combinations, which is of considerable practical importance in connection with the benzene-fast masses.

Independent of the method of their production and the weight relations polyvinyl chloride: phthalic acid butyl ester, these plasticisers always yielded one secondary valency combination of 20 basic moles of vinyl chloride per one mole of Palatinol "C".

If this method is applied to other colloidal systems, similar conditions prevail. The structure of films produced by mixtures of collodion wool and non-solvent plasticizers, such as for instance castor oil, is quite different from that obtained with solvent plasticizers, while certain intermediate conditions between these two extremes are exhibited by films containing plasticizers able to be activated to form solvents for collodion wool by the action of alcohols.

The existence of secondary valency combinations is also indicated by determining the degree of volatility. Thus, in studying the system polyvinyl chloride-phthalic acid butyl ester, it will be found that about 20-24 basic moles combine with one mole of ester by secondary valency reaction.

The problem of the combination of plasticizers with Eucolloids is of prominent importance in connection with all fields of application of the eucolloids, not only in connection with the structure and general properties of paint and

varnish or lacquer films, but with the production foil, leather substitutes, plastics, etc.

Answering a number of inquiries Dr. Thinius advised that the critical temperature of solution of plasticizers is determined as follows:— 1-2 gms of the plasticizer in question are added to 12-15 gms of polyvinyl chloride and the mixtures heated for one or two hours on the water bath as slowly as possible. It is thus possible to determine the critical temperature within 2 degrees centigrade.

#### Ultrasonics in Paint

Dr. G. Troger, *Fette, Seifen, Anstrichmittel*, 52 (1950), 115-120

The author describes the various principles and methods of producing ultrasonic waves (mechanical, thermic and electric processes), concentrating particularly on the ultrasonic whistle and the ultrasonic sirens which generate frequencies ranging from audible sound to 30-40 KHz. Magnetostrictive ultrasonic apparatus furnish frequencies of 20 to 250 KHz while still higher frequencies are produced with piezo-electric apparatus. While ultrasonic processes have not been applied in the paint and varnish industries as yet, at least not on an industrial basis, there can be no doubt

that they will soon prove useful for a number of purposes. Dr. Tröger mentions the three most obvious and important possibilities: 1) the emulsifying action of ultrasonic waves, 2) Decomposition of macromolecules and depolymerization, 3) dispersion of solids suspended in liquids.

Oil-in-water emulsions are produced by blowing the oil into the water through the ultrasonic whistle, or valve, while in another process the oil is projected against the long, sharp edged vibrating plate.

Comparative tests with emulsifiers operating with and without the ultrasonic equipment showed that all other conditions being equal, the ultrasonic method produced 20% hydrous paraffine oil emulsion, as against 5% by the old method. The ultrasonic treatment is usually repeated 3 to 5 times in order to get perfect emulsions; it must not be repeated too often since in that case the whistle-valve does not exert a dispersing, but a coagulating action which naturally destroys the emulsions.

However, the practical application of this and similar methods in the paint and varnish industries still is in its preliminary, or initial, stages since the volumes treated are much too small for bulk production. (i.e. about 50 liters = 13 gallon batches).

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The same applies to the decomposition of macromolecules by ultrasonic treatment. Laboratory experiments indicated that pure linseed oil, for instance, does not respond to 30 minutes of ultrasonic treatment with 350 KHz and 300 watts, while the viscosity of wood oil similarly treated increased from 1385 cp. to 1616 cp.

The dispersing effect of ultrasonic treatment on the pigment contents of paints is considerable. A 5-minutes treatment with 350 KHz and 300 watts (6.3 watts/cm<sup>2</sup>) sufficed to disperse all lumps within the batch treated. All mixtures and all pigments respond to this treatment although conditions vary considerably. While all mineral pigments tested were dispersed within 5-10 minutes, lumpy black required about 60 minutes of treatment for complete dispersion.

### Electrographic Printing

Kronstein, M., Ward, M. W. and Roper, R., *Industrial and Engineering Chemistry* 42(8): 1568-1572, 1950.

Electrographic printing is discussed as a method of determining pores in protective films, water permeability of coatings after salt-fog exposures, Weather-O-meter tests, etc. Procedures for testing of paint coatings on copper, cadmium, nickel, aluminum and magnesium differ only slightly from standard procedure for steel which consists of pressing the test plate between two previously soaked papers (5% KNO<sub>3</sub> in distilled water for 30 min.) at a pressure of 600 lbs./sq. inch under an electron potential of 6 volts for 15-20 seconds. This is repeated for 3 or 4 successive prints. The method enables the worker to make rapid test informing him of the progress of his development work.

## CALENDAR OF EVENTS



- Oct. 16-20. National Safety Congress, Chicago, Ill.  
Oct. 18-20. Society of the Plastics Industry, New Ocean House, Swampscott, Mass.  
Oct. 23-25. Packaging Institute, Annual Forum, Commodore Hotel, New York, N. Y.  
Nov. 9-11. Federation of Paint and Varnish Production Clubs Convention. Congress Hotel, Chicago, Ill.  
Nov. 15-18. National Paint, Varnish and Lacquer Association Convention, Fairmont Hotel, San Francisco, Calif.  
Nov. 18. Third annual paint and varnish chemistry symposium, New York University, College of Engineering, Bronx 53, N. Y.  
Jan. 18-20. Society of Plastics Engineers, National Technical Conference, Statler Hotel, N. Y.  
Mar. 5-9. A.S.T.M., Committee Week and Spring Meeting, Netherland Plaza Hotel, Cincinnati, Ohio.  
Mar. 7-9. Southern Paint and Varnish Production Club Meeting, Buena Vista Hotel, Biloxi, Miss.  
Mar. 13-16. Annual Conference of the National Association of Corrosion Engineers, Hotel Statler, N. Y.  
June 18-22. A.S.T.M. Annual Meeting, Chalfonte - Haddon Hall, Atlantic City, N. J.

## ADVERTISER'S

### INDEX

Abbé Engineering Co. ....	21
Advance Solvents & Chemical Co. ....	Sept.
American Cyanamid Co. ...	4
American Zinc Sales ..	3rd Cover
Bakelite Div., Union Carbide & Carbon Corp. ....	June
Baker & Adamson Products, General Chemical Div., Allied Chemical & Dye Corp. ....	11
The Baker Castor Oil Co. ...	19
Barrett Div., Allied Chemical & Dye Corp. ....	24
Binney & Smith Co. ...	Back Cover
Carbide & Carbon Chemicals Div., Union Carbide & Carbon Corp. ....	Sept.
E. W. Colledge, G. S. A., Inc. Sept. Commercial Solvents Corp. ....	29
Concord Mica Corp. ....	34
The Davies Can Co. ....	21
The English Mica Co. ....	33
Falk & Co. ....	21
W. C. Hardesty Co. ....	Sept.
Hercules Powder Co. ....	27
Kent Machine Works, Inc. July	
J. M. Lehmann Co., Inc. ...	Sept.
Magnetic Pigment Div., Columbian Carbon Co. ...	Sept.
McCloskey Varnish Co. ...	26
Metals Disintegrating Co., Inc. ....	28
National Southern Products Co., Inc. ....	July
Newport Industries, Inc. ....	Front Cover
Nuodex Products Co., Inc. Sept.	
Palmer-Shile Co. ....	33
Pan American Refining Corp., Pan American Chemicals Div. ....	Sept.
The Pennebacker Co. ....	June
Photovolt Corp. ....	24
Reichhold Chemicals, Inc. ....	2nd Cover
Charles Ross & Son Co. ...	30
Shell Oil Co. ....	3
Sindar Corp. ....	23
Sun Oil Co. ....	31
Titanium Pigment Corp. ...	17
Union Carbide & Carbon Corp., Carbide & Carbon Chemicals Div. ....	Sept.
Bakelite Div. ....	June
United Carbon Co., Inc. ...	24
U. S. Industrial Chemicals, Inc. ....	6
Velsicol Corp. ....	Sept.
C. K. Williams & Co. ....	Sept.

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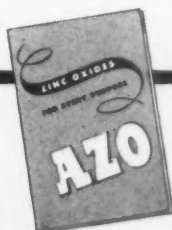
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